APRIL 25, 1924

THE RUBBER AGE

VOL. XV. NO. 2

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

VOL. XV. APRIL 25, 1924 No. 2

SUPREME COURT RULES AGAINST SEIBERLING

Decision of the Third Circuit Court of Appeals in Famous Seiberling-Thropp Suit is Reversed—Declares There has been No Infringement.

On April 7, Chief Justice Taft, in the United States Supreme Court, specifically reversed the decision of the Third Circuit Court of Appeals in declaring invalid the State patent, controlled by Frank A. Seiberling, and ordered the lower court to dismiss the suit brought by Seiberling against John E. Thropp's Sons' Co., Trenton, N. J., for infringement of patent, ending litigation that has been before the courts for years. The decision upholds a decree of the Sixth Circuit Court of Appeals in a previous case brought by Seiberling in which it was held that no infringement had occurred, a decision which the Third Circuit Court of Appeals had reversed.

In rendering its decision the Court said in part, "The making of rubber tires for automobiles began by hand, and the proof seems to show that while power and complicated machines have been applied to secure much greater speed in production and possibly greater uniformity in the product, there is even now no successful device for their complete automatic manufacture."

Traces History of Machines

The history of tire-making machines was traced by the Court from the Moore patent of 1904 to the present time. The Seiberling and Stevens patent of 1904 was on a machine intended to do the work of fitting the fabric to the core wholly by machinery, but the court found that the evidence in the record shows that the device was not successful in its operation. The Vincent patent was issued in 1905; in 1906 the Mathern Belgian patent, which appeared to be a practical machine, was registered.

In pointing out how the State patent fails to provide a new means for making tires, the Court spoke of the methods of licensing Seiberling machines: "Many tires reaching into the millions have been made under a license granted by Seiberling and the success of the device shows the utility and novelty of what he licensed. He gave to his licensees not only the use of State patent but also that of Seiberling and Stevens patents. Both patents made large and sweeping claims which were well calculated to induce acquiescence by those without sufficient knowledge of the prior art, or adequate capital to resist. Yet the more comprehensive claims of the State patent have now been disclaimed and the Seiberling and Stevens patent included in his licenses has been abandoned. There has been a complete change brought about in the Third Circuit suit. Mr. Seiberling, when these licenses were granted was at the head of the great Goodyear Co. He could give great vogue to the device owned and used by him. The license was not a heavy tax, equal to less than one per cent of the cost of the machine, and purchase of peace was a wise course for the smaller manufacturer. Evidence of this kind is often very persuasive, especially when patentable novelty is in doubt, but it is by no means conclusive and must be weighed in the light of all the circumstances, to accord it its proper significance. In the case before us we do not think it can overcome the lack of novelty and invention."

The Full Opinion of the Court

WASHINGTON, D. C. April 7, 1924—Chief Justice Taft, sitting in the Supreme Court of the United States, in the case of The John E. Thropp's Sons' Co., petitioner, versus Frank A. Seiberling, on Writ of Certiorari to the Circuit Court of Appeals for the Third Circuit, today delivered the opinion of the Court, which is reported in full below:

This is a suit to enjoin the infringement of a patent for the making of the outer shoes or casings of pneumatic automobile tires, composed of woven fabric treated with rubber. We have brought it here because of a conflict of opinion

(Continued on Page 50)

HARVEY PUTS ONE OVER

The smug smile of satisfaction on the face of Harvey Willson, Assistant Manager of the Rubber Association, has at last been explained—he's married! After a secret courtship of several years Harvey recently announced his engagement to Miss Mary McAuliffe and inquiries as to the date of the nuptials elicited noncommital replies. In the meantime he got married and again the office was s u r p r i s e d. Congratulations, Harvey!

NEW 90-DAY WARRANTY FOR TIRES ANNOUNCED

New Policy Adopted as Economy and Efficiency Measure of Tire Industry—Will Reduce Adjustment Costs Materially—Dealers Will Benefit.

The first real step towards effecting the economies recently advocated by Mr. Rutherford has been taken by the Tire Manufacturers Division of the Rubber Association of America in announcing the terms of a new 90-day warranty for pneumatic tires in place of the present Standard Warranty. The previous policy and mileage guarantee had been abolished on January 1, 1922, and the Standard Warranty had been in effect from that date. The new 90-day warranty will take effect on May 1, according to the bulletin issued by the tire division.

This move is in keeping with the policy of efficiency and economy which the tire manufacturing industry is endeavoring to adopt, and will in a large measure, assist tire dealers to minimize the loss of profits for which unwarranted adjustments are responsible. It was felt by the Tire Manufacturers Division that tires should be sold like other commodities, that is, on a basis of merit with adjustments made for defects which would in almost every case become apparent within 90 days. Losses due to adjustments in 1923 were estimated at $10,000,000 and the new warranty is expected to cut this in half. The complete warranty is reproduced in the box on Page 48 and the information given below is taken from the announcement of the tire division.

The Reasons for a 90-day Warranty

This revised warranty is in line with the efforts being exerted in the tire industry to bring about greater efficiency and economy in the conduct of the business. Not until every item of needless expense has been eradicated can the tire industry be said to be on an economically sound basis. Adjustment losses offer the greatest opportunity for legitimate saving. It is estimated that in 1923 the total adjustment loss of the industry amounted to more than ten million dollars, not including the operating expense of handling the claims. The biggest part of this loss resulted from replacing tires that had given reasonable wear.

(Continued on Page 48)

SENECA G. LEWIS TAKES OWN LIFE

Depression Following Illness Believed To Be Reason for Action—Had Been With Pennsylvania Rubber Co. for 15 Years—Formerly With Detroit Hardware Firm.

The rubber industry was shocked on April 14 when it learned that Seneca G. Lewis, for 15 years Vice-President and General Manager of the Pennsylvania Rubber Co., Jeanette, Pa., had committed suicide at his home in Greensburg, Pa., by shooting himself in the head. Mr. Lewis had been very much depressed of late as a result of illness and it is thought that this was the reason for his action.

Three letters were left by Mr. Lewis, one each for his wife, his daughter and C. M. DuPuy, President of the Pennsylvania Rubber Co. No intimation has been given out as to the contents of these letters but it is said that they contained no reasons for Mr. Lewis' action.

Mr. Lewis was re-elected last May as Vice-President and General Manager of the above company. Previous to this connection he had been with the Fletcher Hardware Co., in Detroit. Funeral services were held in Greensburg on April 16. Among representatives of the rubber industry attending were Messrs. Viles and Weston. A number of former Detroit associates also attended. Mr. Lewis was 47 years old and is survived by his wife and daughter.

He had been active in the affairs of the Rubber Association during the past few years and was represented on the Board of Directors for 1922 and 1923, the Tire Executive Committee in 1922 and 1923 and on the Budget Committee in 1923.

Few in the rubber industry enjoyed a greater number of warm friendships among business associates than Mr. Lewis. In the industry as well as in the greater business world, he held an enviable position because no person hesitated to acknowledge him as honorable, just and capable.

A. L. Viles, general manager of The Rubber Association, in a bulletin sent to members, wrote of him: "At a time when the experience, sound judgment and energy of men of the calibre of Mr. Lewis are urgently needed to see our industry through troubled waters, it is particularly saddening to lose him."

McKone Workers Strike

The Plant of the McKone Rubber Co., Millersburg, Ohio, is closed due to a strike of the tire builders, who, following a 20 per cent cut in wages, recently walked out in a body.

Supreme Starts Operations

The Cleveland, Ohio, plant of the former Ideal Tire & Rubber Co., which a stockholders committee purchased from the receiver, began operations April 2, according to William Harrison, chairman of the stockholders committee. The new company, which has been named the Supreme Tire & Rubber Co., will manufacture asbestine tires and mechanical goods. A daily production of 200,000 heels to be trade-marked "The Elk," will be marketed by the company, it is reported. About 2,000 of the original 10,000 stockholders took stock in the new corporation.

Commits Suicide

Seneca G. Lewis

Heads S.A. Rubber Group

David Beecroft, of the Class Journal Publishing Co., 239 West 39th St., New York City, has accepted the chairmanship of the auto, oils and rubber group in the Home Service Appeal of the Salvation Army for a maintenance fund of $512,500 for its work in Greater New York during 1924.

National On 5-Day Schedule

Because of the receipt recently of large orders the plant of the National India Rubber Co., Bristol, R. I. has been on a five-day schedule since the end of March. From indications at this writing, it is expected that shoe orders will keep the company busy for some weeks.

TIRE FACTORY FOR HOLY LAND

A cable received at New York April 2 states that an American tire factory has begun operations at Nazareth in Palestine. The raw materials will be imported from America, it is stated. It is thought that the factory will supply a great demand for American tires in Palestine because the majority of cars used there are of American manufacture.

LEE PLANT NOW MAKES REPUBLIC PNEUMATICS

At a meeting of the directors of the Republic Rubber Company held March 31 at Youngstown, Ohio, the current rate of tonnage production of mechanical rubber goods at the Youngstown plant was reported to be the largest in the history of the company. It was demonstrated at the meeting that full Youngstown plant equipment will soon be needed for the manufacture of Republic mechanical rubber goods, truck, solid tires and inner tubes.

Therefore it was decided to take advantage of the increased plant equipment of the Lee Tire & Rubber Company factory at Conshohocken, Pa., and transfer the manufacture of the full line of Republic pneumatic tires, both regular and balloon, from the Republic plant to the Lee Conshohocken plant. By concentrating their pneumatic tire output under one roof the Lee Rubber & Tire Corp. completed their reorganization plan since their purchase of the Republic Rubber Company.

During 1923 the Lee Conshohocken plant's capacity was enlarged by the addition of a new machinery and equipment of the very latest type which permits the manufacture of 4000 tires daily. Therefore the Conshohocken plant can now manufacture both Lee and Republic brands of pneumatic tires on a most economical basis.

N.A.C.C. Confers on Balloons

At a regular monthly meeting held in New York City April 3, directors of the National Automobile Chamber of Commerce picked a special committee to confer as soon as possible with the Rubber Association and the Society of Automotive Engineers on the subject of balloon tires. Alvan Macauley heads the committee composed of the following: H. H. Rice, O. C. Hutchinson and R. C. Rueschaw. It is the purpose of this committee to seek balloon standards and to consult with enginers and tire makers on the proper use of the new tires.

A.C.S. Rubber Division Meets

A meeting of the Rubber Division of the American Chemical Society is being held with the Spring meeting of the Society with the Washington Section at Washington, D. C., April 21 to 26, inclusive. Sixteen papers describing chemical progress will be presented but at the time this issue went to press complete information was not available. Full abstracts of all papers presented will be published in our next issue. A dinner of the Rubber Division was scheduled for Thursday evening, April 24, at Harvey's restaurant, at which a large attendance was expected. Committees on Physical Testing Methods and Crude Rubber Testing made reports at the meeting of the Division.

AJAX SHOWS NET LOSS OF $560,390

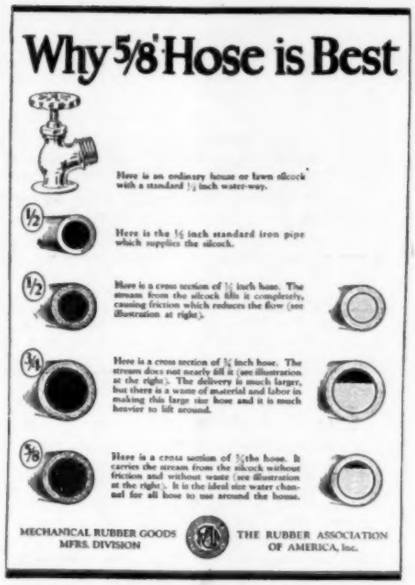
Caused by Price Reductions, Liquidation of Subsidiary Companies and Raw Material Inventory Adjustments, says President in Statement to Board.

The Ajax Rubber Co., Inc., New York City, for the year ending December 31, 1923, reported April 1 a net loss of $560,390.03 after interest, liquidation of certain subsidiaries, adjustments of raw material inventories, etc. A net profit of $26,537 was shown in 1922. The income account for the two years is as follows:

	1923	1922	Decrease
Gross profit	$435,968	$557,288	$121,320
Other income	116,917	108,536	*8,381
Total income	552,885	665,824	112,939
Int. deprec., etc.	569,322	639,287	69,695
Extraord. adj.	‡543,953	—	*543,953
Net	†560,390	26,537	586,927

*Decrease. †Loss.
‡Includes loss from liquidation from certain subsidiary companies and inventory adjustment, etc.

In submitting the report President J. C. Weston said in part: "Operations covering the first six months of the year .... gave promise of fair profits. These, however, were not realized because of price reductions effective throughout the trade during the last six months, which competition we were obliged to meet, resulting in an operating loss for the year of $16,436.50.


Why 5/8 Hose is Best
Here is an ordinary house or lawn silcock with a standard ½ inch water-way.
½
Here is the ½ inch standard iron pipe which supplies the silcock.
½
Here is a cross section of ½ inch hose. The stream from the silcock fills it completely, causing friction which reduces the flow (see illustration at right).
¾
Here is a cross section of ¾ inch hose. The stream does not nearly fill it (see illustration at the right). The delivery is much larger, but there is a waste of material and labor in making this large size hose and it is much heavier to lift around.
⅝
Here is a cross section of ⅝ the hose. It carries the stream from the silcock without friction and without waste (see illustration at the right). It is the ideal size water channel for all hose to use around the house.
MECHANICAL RUBBER GOODS MFRS. DIVISION
THE RUBBER ASSOCIATION OF AMERICA, Inc.

One of Series of Advertisements Used in Hose Campaign

"Price reductions, effective throughout the trade during the last six months of the year, which competition we were obliged to meet, resulted in an operating loss for the year of $16,437."

The balance sheet is reproduced herewith:

BALANCE SHEET
Ajax Rubber Co., Inc.

ASSETS

CURRENT ASSETS:			
Cash in banks and on hand		$306,162.82	
Accounts and Notes Receivable:			
Trade accounts	$2,964,305.49		
Trade notes	139,395.21		
Other accounts	10,851.21		
	3,114,551.91		
Less—Reserve for discounts, bad and doubtful accounts	132,808.33	2,981,743.58	
Inventories:			
Finished stock	$1,553,780.07		
Work in process	196,660.12		
Raw materials and supplies	1,023,438.56	2,773,878.75	$6,061,785.15
MISCELLANEOUS ACCOUNTS AND NOTES RECEIVABLE			34,135.34
INVESTMENTS:			
Investments in and balances due from affiliated companies		$336,779.21	
Mortgages receivable		95,388.03	432,167.24
CAPITAL ASSETS:			
Land, buildings, houses for employees, machinery and equipment		$5,684,174.58	
Less—Reserve for depreciation		1,496,377.88	4,187,796.70
GOODWILL AND PATENTS			1,874,875.16
DEFERRED CHARGES TO OPERATIONS INCLUDING BOND DISCOUNT			359,073.44
			$12,949,833.03

LIABILITIES

CURRENT LIABILITIES:			
Accounts payable		$1,486,863.14	
Accrued liabilities		187,171.82	$1,674,034.96
FIRST MORTGAGE 15-YEAR SINKING FUND GOLD BONDS DUE DECEMBER 1, 1936		$3,000,000.00	
Less—Bonds purchased and retired		303,800.00	2,696,200.00
CAPITAL:			
Stated capital under the Stock Corporation Law of New York		$10,000,000.00	
Capital as per balance sheet at December 31, 1922		$9,208,799.11	
Deduct—Adjustment of Federal Taxes, deficits of subsidiary companies and miscellaneous adjustments not applicable to 1923 operations (net)		68,811.01	
		$9,139,988.10	
Deduct—Loss for year ended December 31, 1923		560,390.03	
Capital at December 31, 1923, represented by 500,000 shares of no par value of which 425,000 are issued and outstanding			8,579,598.07
			$12,949,833.03

START CAMPAIGN TO STANDARDIZE HOSE

Rubber Goods Manufacturers Division of R. A. A. Approves of Adoption of 5/8" Garden Hose as Standard—$10,000 Appropriated for Advertising.

The Mechanical Rubber Goods Manufacturers Division of the Rubber Association has approved the plan to adopt the ⅝" size of garden hose as standard and eliminate the ½" and ¾" sizes. Last fall while in convention, the National Hardware Association, composed of hardware jobbers, unanimously approved of the standardization of the ⅝" size. In addition, over twenty state retail hardware dealer associations throughout the country have either specifically endorsed the plan or expressed their desire to co-operate on a simplification program. It is expected that the plan will also be approved when the National Retail Hardware Dealers Association convenes.

In advertising the adoption of the ⅝" size as standard, the board of directors of the Rubber Association has appropriated $10,000 for the use of the Mechanical Rubber Goods Manufacturers Division. The Garden Hose Committee of this division contemplates a six months' advertising campaign in the hardware trade papers. The advertising will draw comparisons between the ½", ¾" and ⅝" sizes in an effort to prove the common-sense policy in back of the effort at standardization. One of these advertisements is reproduced on this page.

Just prior to the appearance of the first advertisement, approximately 5,000 hardware jobbers and 30,000 hardware dealers throughout the country will be circularized.

Details of the advertising campaign are being handled by R. E. Conder, sales promotion manager of the Boston Woven Hose & Rubber Co., and the office of the Rubber Association at 250 West 57th St., New York City. All details of the campaign are under the supervision of the Garden Hose Committee which consists of: Chairman, George E. Hall, Boston Woven Hose & Rubber Co.; D. R. Burr, Goodyear Tire & Rubber Co.; C. D. Garrettson, Electric Hose & Rubber; and J. A. Lambert, Acme Rubber Manufacturing Co.

Calgary Plant for Carbon Black

Under the name of Prairie Oils, Ltd., a company is being formed at Calgary, Alberta, Canada, to manufacture carbon black from natural gas. A permit has been issued by the Dominion Government which previously had been loath to give such projects encouragement because of the fact that natural gas has greater value for illuminating and heating purposes than for the manufacture of carbon black. The new company will start operations with a capital of $200,000 dividend into 200,000 shares of $1 par value.

NEW 90-DAY WARRANTY FOR TIRES ANNOUNCED

(Continued from Page 45)

Tire manufacturers have been accustomed to replacing practically all tires containing any conditions that might possibly be considered imperfections. The trade has expected absolute perfection in every tire instead of recognizing the normal variation which always will exist in tires, as in other articles of wear.

Such a condition is unsound. Experienced tire men know that a genuine defect will become evident in the early life of a tire. Failures occurring later may properly be regarded as the result of the normal variation which always will be found in tires, even though, on the whole, they meet the established commercial standards. This natural variation is emphasized by the greatly differing conditions under which tires are used.

NEW 90-DAY TIRE WARRANTY

We do not guarantee pneumatic automobile tires for any specific mileage. Every pneumatic automobile tire bearing our name and serial number is warranted by us against defects in material or workmanship developing within 90-days from date of first road wear.

No claims hereunder will be entertained unless the tire claimed to be defective is presented within the said 90-day period, all transportation charges prepaid, and accompanied by this Company's claim form duly filled out, certified and personally signed by the user of the tire.

If upon examination of the tire so presented it is our judgment that the direct cause of its failure is attributable to defective material or workmanship, we will, at our option, either repair the tire or make a reasonable allowance on the purchase price of a new tire.

Pneumatic automobile tires in which a substitute for air has been used, tires used when not inflated to the pressure recommended by us, used under loads in excess of those recommended by us, used on wheels out of alignment, abused or misused, used on rims other than those bearing these stamps (rim stamps here), or which have been injured through accident or design, are not subject to claim hereunder.

This Company's Warranty is given solely to the original user and only to the extent above expressed. No dealer or agent is authorized to make any other or additional "Guaranty" or "Warranty."

Based on Equitable Adjustments

The Revised Standard Tire Warranty is based upon the correct principle of providing for equitable adjustments on tires failing after short service on account of actual defects, and not providing for adjustments on tires that have given a reasonable amount of service.

This is another step toward selling tires on the basis of merit only, which is fundamentally sound and a protection to the consumer. When tires are sold on merit only, it is necessary for every manufacturer to protect his quality above all, or suffer the penalty of reduced sales. This assures the consumer of greater uniformity of quality and of less likelihood of tire trouble.

So far as the dealer is concerned, this should minimize his adjustment difficulty by more clearly defining the rights of the tire owner and the responsibility of the manufacturer—thus lessening the opportunities for controversy. Furthermore, the dealer will be relieved entirely of handling a large number of claims that have caused him endless inconvenience in the past.

From the manufacturer's point of view, the new 90-day Warranty should have an automatic and immediate effect in reducing the total number of claims presented because the 90-day limit will outlaw many unmerited cases which now are being considered. The resultant economy will be a strong factor in enabling the tire manufacturer to partially offset increased costs of manufacture and distribution.

Operation of 90-day Warranty

Date Effective: It is recommended that the revised Warranty go into effect on May 1st. It will apply to all pneumatic tires received by consumers as original equipment on automobiles and trucks, or purchased from tire dealers, on and after that date.

Letter Notification to Dealers: The Tire Manufacturers Division of the Rubber Association of America will formally announce the new Warranty to the tire dealers of the country with an appropriate statement of its advantages. It is recommended that members of the Tire Division support the Association's announcement by confirming it to their dealers so far as their particular company's relations with them are concerned.

Poster: A poster or wall hangar presenting the new Warranty and its benefits is also being prepared and will be ready for distribution to dealers in the near future.

Standard Claim Form and Report on Claim: As a part of the recommended program it should be definitely understood that every claim must be submitted on a Standard Claim Form. The use of the "Report on Claim" will be continued in order to inform consumers and dealers simultaneously of the manufacturer's adjustment offer.

Checking Information on Claim Forms: As a whole, tire dealers appear to be heartily in favor of anything that will tend to lessen the inconvenience and cost of handling adjustments. Consequently, it is assumed that they will support the recommended program and will assist in checking information on claim forms regarding the length of time the tire has been in road service. Many dealers are now keeping a complete record of their sales by serial number and can tell a customer definitely just when the tire was applied.

It is recommended that each manufacturer make an effort to get all his dealers to keep such a record and that he assist them to do so by providing a standard form for this purpose, if practicable.

However, *the success of the new 90-day Warranty will not depend entirely on checking the information on the Claim Form:* first, because if a tire has been run considerably more than 90 days, it is probable that the condition of the tire would indicate it and would arouse the suspicion of the adjuster, so that he will ask for additional evidence to support the claim; second, because the adoption of the 90-day clause will automatically reduce the number of claims presented inasmuch as hundreds of tire users, knowing that no claims will be entertained after 90 days, will not ask for adjustments on tires which have passed that limit. Heretofore, there being no time limit, many claims were made on tires which had been in road service much longer than 90 days.

Discussion by Salesmen with Dealers: The most satisfactory method of establishing the new policy is by personal discussion between salesmen and dealers. Thereby the salesmen can more thoroughly explain it than is possible by letter and can also immediately answer such questions as may arise.

Salesmen should emphasize to dealers that the action taken by the members of the Rubber Association is in accord with the often expressed desire of tire dealers that the manufacturers take further steps to solve the adjustment problem. Dealers have frequently suggested the use of only an ordinary commercial warranty, similar to the warrantees covering other articles of merchandise.

The adoption of the new Warranty is a big step in that direction. In fact, for the present, the new Warranty is better than the ordinary commercial warranty, because it provides dealers and adjusters with a definite basis for separating the merited from the unmerited claims, with less likelihood of controversy than would result from the use of the ordinary commercial warranty.

This whole program is certain to result advantageously to the dealer. It is necessary, however, to induce the dealer to see the subject in that light and the biggest share of this responsibility unquestionably rest with the sales representatives of each manufacturer.

Those sales representatives who discuss this subject with their dealers immediately will save themselves considerable trouble later on. It is much easier to explain the subject at once than to have it brought up by the dealer after some of his claims have been turned down under the new warranty.

In this connection, dealers should be urged to direct the attention of their customers to the announcements of the manufacturers concerning the 90-day limit. In every way possible they should emphasize to the customer the importance to him of the change. If tire users are made fully acquainted with the 90-day limit at the time a tire is sold, the dealer will avoid the later controversy and dissatisfaction which otherwise would result.

Meeting in Cleveland

It is planned to hold a meeting of the Service Managers Committee of the Tire Division in Cleveland during the first week in May to discuss the operation of the new warranty and to allow any one interested to ask questions on various points which may not be clear. Dealers, salesmen and others will be welcomed at this meeting, definite announcement of which will be made shortly by the Rubber Association.

Ashland Stockholders Dine

Stockholders of the Ashland Tire & Rubber Co., Ashland, Ohio, were banqueted April 1 at the plant by C. D. Darrah, president and general manager, and M. V. Semple, secretary. Talks were made by the officers and by R. J. Powell, factory manager; Frank Harris, Web Rybolt, Harry Vanosdall, W. W. Palmer, F. R. Beer, Dr. D. L. Mohn, Dr. C. G. DeVoe and others. A tour of the plant was made while it was in operation so that the stockholders could observe the various processes taken in building Ashland cord casings.

Newton Falls Holdings Sold

Because there was no bidding when the buildings and equipment of the Newton Falls Rubber Co., Newton Falls, Ohio, were offered at public auction April 8, the property was sold in sections. The Union Savings & Trust Co. of Warren, which, it was said, held a mortgage on the property amounting to $180,000, bought the buildings for $170,000. The Denman-Myers Cord Tire Co. bought a quantity of chemicals and fabrics.

SMALL COMPANIES URGED TO FURNISH TIRE STATISTICS

The Rubber Association of America, which issues monthly reports of the production, shipments and inventory of casings, tubes and solids, is making an effort to secure the cooperation of all tire manufacturers who are not members of the association. Present reports issued by the association comprise a monthly record of about 75 per cent of the country's production. In order to get statistics that will more accurately portray the condition of the industry, all non-member manufacturers are being circularized and being requested for their cooperation on this important matter which is of incalculable benefit to the whole industry.

In a recent letter to manufacturers, the association pointed out that the statistics to the trade in general show only totals and trends and that the more interesting details respecting sizes and types are available only to those who assist in the compilation of the statistics by reporting monthly their production, shipments and inventory by sizes and types. It is not necessary for a company to openly identify itself with the report because code designations are used on the printed forms upon which these reports are made. Moreover, the confidential report of each company is returned as soon as the totals are compiled.

The complete statistics are especially valuable at this time, for many questions naturally come to mind, which can not be easily answered, such as the following:

How fast balloon and semi-balloon tires are making inroads on the high-pressure tire?
What sizes in balloons and semiballoons are coming fastest?
What sizes in high-pressure tires are most affected, as a consequence?
Whether manufacturers' stocks of high-pressure tires are being reduced in proportion to the increasing popularity of balloons—or whether high pressure tires will become a drug on the market?
Whether the inventory and production of the 30 x 3½ high-pressure tire are properly proportioned to all other sizes and to the total number of cars requiring that size?
To what extent dual-pneumatics for trucks are supplanting giant pneumatics or vice versa?
How popular are the high-pressure tires in 20" diameters for trucks, taxis, etc?
How much of a factor is the cushion tire—and in what sizes?

All tire manufacturers who are not furnishing the Rubber Association with their production figures should do so as soon as possible. Only by such cooperation can the published figures be of the greatest value to every tire manufacturer.

CRUDE IMPORTS RANK FOURTH IN 1923

Crude rubber imports of 692,000,000 pounds in 1923 were 18,000,000 pounds, or about 2.6 per cent, larger than 1922 receipts, according to an analysis of American world trade recently completed by the Foreign Commerce Department of the United States Chamber of Commerce. Arranged by value, automobile tires rank 33rd on the list of chief exports, total value being given as $17,669,000. Coated or water-proofed textile fabrics exported gained 25 per cent in value over those of the previous year.

Crude rubber ranks fourth on list of 100 chief imports according to value for 1923, being 4.8 per cent of our total imports as to value, and showing a gain of 82 per cent over 1922 values. The value of crude rubber imported last year was $185,058,000. (The 100 chief imports, in value, listed by the Chamber of Commerce represent 86% of the total value of all imports.)

INTERCONTINENTAL CO. REPORTS FOR 1923

The report of the Intercontinental Rubber Co., Jersey City, N. J., for the fiscal year ended December 31st last shows assets of $33,608,258, consisting of stock issues of $28,198,575; cash for purchase of securities or as loans and advances to subsidiaries of $5,201,316; investment in nitrate property of $51,318; sundry accounts, claims, etc. $56,866; investment securities $84,750; and cash $15,387.

Liabilities are listed as: Common stock, $29,030,000; accounts payable, taxes accrued, etc. $15,662; reserves, $525,132; surplus, $4,037,464; total, $33,608,258.

The Intercontinental Rubber Products Corp. and subsidiary companies report after taxes, interest, etc., a net profit of $58,515.

Directors with the exception of Edward B. Aldrich, who was succeeded by Wilbur C. Goodale, were reelected. According to George H. Carnahan, president, two of the company's factories at Torreon and Cedros produced 2,742,779 pounds of dry rubber and are now being operated at normal capacity despite political disturbances in Mexico. During the year a new milling unit in Mexico was financed by $290,300 of Series B notes and opened in February of this year. The capacity of the Cedros plant was also increased 20%. An additional $143,000 was invested in the Sumatra plantation which is not yet self-sustaining.

DuBois Plant Sold

G. H. Kaiser, a stockholder, bought the realty, plant and equipment of the DuBois Rubber & Tire Co., Chattanooga, Tenn., which was sold April 5 to satisfy a $25,000 note held by the First Trust & Savings Bank. The plant, which represents an investment of approximately $225,000, including the property and equipment, brought but $29,000.

The property includes a four-acre site in Alton Park. All machinery and equipment, with the exception of one tire wrapper and motor, goes with the factory. Some years ago the company was organized to manufacture DuBois tires and tubes; later, Old Hickory brand tires were manufactured.

It is understood that Mr. Kaiser represents a group of stockholders in the old company, the affairs of which will soon be wound up. A new company is under process of organization, and as quickly as arrangements can be completed the plant will be reopened for the manufacture of tires and tubes.

BIG FIRE DAMAGES RUBBERCRAFT PLANT

Fire of unknown origin shortly before midnight March 29 caused approximately $10,000 damage to the factory of the Rubbercraft Corp., Doylestown, Pa. Included in the loss were 70,000 rubber balls that were ready for shipment. According to the president, W. J. McLaughlin, all of the damage, except $3,000 is covered by insurance. None of the rubber goods on order and in process of manufacture were insured. At this writing it was expected that the plant would soon be in operation again.

Less than a year ago the Rubbercraft Corporation, manufacturers of rubber balls, toys and moulded rubber goods, moved to Doyleston from Stockton, N. J. where on February 16, 1923 the plant burned down with considerable loss. In Stockton the company was known as the Tillinghast Rubber Co. Approximately forty persons are employed at the Doylestown plant. It is stated that sufficient orders are on hand to keep the plant busy night and day for some time.

Colloid Symposium Slated

As joint guests of Northwestern University and the Chicago Section of the American Chemical Society, the Second National Symposium on Colloid Chemistry will meet June 18-21, 1924 in Evanston, Ill. The program will be in charge of the committee on colloid chemistry of the National Research Council, of which Professor Harry N. Holmes of Oberlin College is chairman. It will be remembered by readers of THE RUBBER AGE that the first symposium was held at the University of Wisconsin, Madison, Wis., June, 1923.

Chemists who intend to be present at the symposium and who desire to make room reservations should communicate with Frank C. Whitmore, Northwestern University, Evanston, Ill. It is likely that many of the visiting chemists may be accommodated in the college dormitories.

Fire Destroys Rubber Plant

Fire of undetermined origin on April 4 burned out the two story brick plant of the Pennsylvania Rubber & Supply Co., Cleveland, Ohio. Loss is estimated at $250,000. When a drum of alcohol exploded several firemen narrowly escaped serious injury.

Henderson in Fisk Building

F. R. Henderson & Co., Inc., crude rubber importers and brokers, on April 15 announced their removal from 111 Broadway to the Fisk Building, 250 West 57th St., New York, N. Y.

McKee in New Location

John A. McKee & Co., crude rubber examiners and appraisers, formerly located at 44 Whitehall St., have removed to 25 Beaver St., New York, N. Y. where they now occupy suite 408.

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between the Circuit Courts of Appeals of the Sixth and the Third Circuits.

The suit in each Circuit was begun by Frank A. Seiberling, as assignee. That in the Sixth Circuit was filed in 1914 against the Firetsone Tire and Rubber Company, and was based on alleged infringement of three claims of a patent to Seiberling and Stevens, No. 762561, of June 14, 1904, and sixteen claims of a patent to one State, No. 941962, dated November 30, 1909. The District Judge found both patents valid and infringed, 234 Fed. 370. The Firestone Company appealed and the Circuit Court of Appeals for the Sixth Circuit reversed the District Court, holding that all the claims of the State patent were invalid, and that of the three claims of the Seiberling and Stevens patent, two were invalid and one was not infringed. 257 Fed. 74. The bill in the case before us was brought in 1914 in the District of New Jersey on the same two patents. After the decision in the Sixth Circuit in December, 1918, the plaintiff Seiberling filed in the Patent Office a disclaimer absolute as to eight claims of the State patent and qualified as to the other eleven.

No proofs were made in this case to sustain suit upon the Seiberling and Stevens patent, State, the patentee of the other patent, having testified that it had failed. The District Judge dismissed the bill on the ground that the effect of the disclaimers on the State patent was to change it from a machine patent and to make it a method or process patent and that the method was old. On appeal to the Circuit Court of Appeals for the Third Cirsuit, a majority of that Court held that the record herein in respect to the State patent was substantially different from that in the Sixth Circuit, and that the State patent as qualified by the disclaimers was valid and infringed. The third Judge dissented on the ground that the disclaimers were of such a character as not to be permitted by the statute.

THE HISTORY OF TIRE MAKING

The making of rubber tires for automobiles began by hand and the proof seems to show that while power and complicated mechanism have been applied to secure much greater speed in production and possibly greater uniformity in the product, there is even now no successful device for their completely automatic manufacture.

A hand tire was framed on an annular metallic core of the proper size, with spokes and a hub mounted and revolving on a shaft. It was made up of layers of fabric stuck together by a proper adhesive material and formed into a tube with a narrow opening on the inside, called the bead. The ends of the tube were united together to make it circular and endless The layers were arranged to give a solid rubber tread along the outer periphery to make contact with the road. The workman began by coating the core with a suitable cement, and affixed a strip of the rubber impregnated fabric, stretching it and cutting it so as to cover the circumference of the core. In width it was somewhat less than enough to cover the sides of the core. He then revolved the core slowly, patting and stretching the woven strip on it, pressing and shaping it with his fingers and hand tools so that it adhered smoothly to the core without wrinkles. He followed this with another strip of fabric attaching it to the one before by the rubber cement. This operation he repeated with as many layers as were needed.

The strips of the fabric were cut on the bias, and the warp threads of one strip when set in place were intended to run from one inner open edge or bead, in a diagonal course, along, across and around the tube to its other open edge or bead. The next strip or layer was reversed so that its warp threads crossed those of the first strip at a selected angle.

There was no difficulty in making the part of the layer on the tread easy and smooth because the curvature there was small, but as the fabric was pressed against the sides and inside of the core, it tended to bagginess and did not lie so smoothly. It would gather and wrinkle. This if carried into the permanent condition of the fabric would greatly weaken the tire. The tendency of woven material, however, is to contract in one direction as it stretches in another. The fabric lengthens circumferentially as it is stretched on the outer periphery. The square meshes thus become diamond shaped along the tread. There is a corresponding longitudinal contraction in the fabric as it is stretched laterally down the sides, so that its shrinking will be greatest as the edges are approached. Thus the wrinkling and bagginess of the fabric may by proper treatment with hand and tool be made to disappear and the strip be shaped smoothly to the sides and beads of the core surface.

At first, the skirts of the fabric were stretched radially along the sides of the core and treated by a saw-tooth tool to avoid wrinkles and then a spinning roll or wheel was spun along the fabric down the core side in spiral course. There was thus given to the fabric what was called the double stretch and this was supposed to give greater strength and smoothness to the fabric as set upon the core. The workmen, however, found that they could work more rapidly and with less pains if they gave up the saw tooth stretch and depended only on the use of the spinning wheel with which, by increasing the hand speed of the core they could smooth the fabric against the core without wrinkles. The spinning or stitching of the sides by the rapid revolution of the core had been previously shown in the kindred art of shaping thin metal sheets over a power driven core. The evidence was that rotation of the core by hand to a speed of fifty or sixty revolutions a minute would give a centrifugal tendency to the skirt of the fabric, keeping it away from the core. By thus doing what the foremen of the shops at first deprecated, the workmen developed a successful improvement in the hand making of tires. The spinning was usually done one side at a time; but powerful workmen were known to work the spinning wheels together on both sides of the core. The spinning of the fabric by rotating the core rapidly was more usual in tires of smaller sizes because the fabric was so stiff that such a method by hand in larger tires was impracticable.

THE MOORE PATENT

One of the early power machines to make tire casings was patented to Moore in 1894. It disclosed an expansible core upon which an endless rubber fabric was placed and stretched. The core was rotated rapidly by power and the fabric was rolled down by a set of rollers of which one was a spinning roller. This was pivoted to swing radially toward the core but the handle of the spinning wheel was so fixed that it could not travel as far down as the bead.

The Seiberling and Stevens patent of 1904 for making tires sought to do the work of fitting the fabric to the core wholly by machinery, i. e., automatically without the intervention of the hand of the operator. It comprised

1st. A main power driven shaft to drive the core capable of low or quick revolutions, or entire release,

2nd. A reel carrying the rubber impregnated strip,

3rd. A tension roller retarding the reel and stretching the fabric on the periphery after the free end is attached to the core,

4th. A pressure roller concave in form to match the tread of the strip and press it to the core as it revolves,

5th. An arm carrying a laterally spring pressed finger called a jigger finger intended to be reciprocated rapidly, radially of the core, travelling in and out between the tread and in its outer edge, functioning like a human finger in pressing the fabric down against the core and stretching it into shape; and,

6th. A further pressure wheel or spinning roller applied along the edge of the fabric to press it into a crease. The spinning roller was set in a plane at a receding angle to the plane of the core.

The evidence in this record shows that Seiberling and Stevens' device was not successful in its operation and that the automatic operation of the finger was not effective.

The Vincent patent of 1905 had a power driven core, to draw and stretch the fabric with guide rolls through which the fabric was led on its way to the core and which were geared so as to resist the pull of the fabric. As soon as the fabric was spread circumferentially on the core, its skirts or edges were formed down the sides by two sets of spring actuated hammers, arranged progressively in a radial direction so that as the core rotated the fabric was tapped on the sides from their outer portion inwardly toward the bead. This device seems to have had considerable commercial use.

THE MATHERN PATENT

The Mathern Belgian Patent of 1906 had a core arranged to be power driven at high and low speeds effected by changing gears, the ratio between the two being 20 to 1. It had a stock roll from which the fabric passed at a tension around guide rolls and between conical gears to secure uniform puckers in the outer edges of the fabric and to hold it out from the core as its middle is delivered circumferentially to become the tread. A screw fed slide was arranged to be moved radially to the core, having suspended on pins a pair of spinning rolls, the handles of which enable the operator to press them laterally against the skirts of the fabric on the core during their inward radial movement.

The Belgian Mathern patent is attacked as a paper patent because it was allowed to expire through failure to pay the annual Belgian tax. The evidence shows, however, that in 1911 it was offered commercially to the Hood Company which preferred a German patent of the same inventor, and the Belgian machine was actually used for the making of tires which proved to be commercially satisfactory. We do not doubt from the record that it was a practical tire-making machine.

The State patent was applied for March 26, 1909. It was of the same general type as that of Seiberling and Stevens. State's most substantial change was that he discarded the reciprocal, spring pressed, in and out forming finger of Seiberling and Stevens and substituted spring pressed spinning rolls which he supplemented with stitching rolls if needed. He provided in the same general way as Seiberling and Stevens, a core, a fabric reel, a retarding or tension device, whereby he attached his strip of fabric to the core for the width of the tread portion, leaving the skirts or wings projecting outwardly. Fixed to the base of the frame carrying the core was a standard travelling in a horizontal track with a turret, having four tools mounted at four equidistant points and independent of each other except for their common base. One carried a tread roller, the second the spinning rollers, the third the stitching rolls and the fourth the bead attaching rolls. The operator revolved the turret so as to make the tread roller bear against the tread on the core, then the spinning roll device, then the stitching roll and then the bead forming roll, the latter two of which were not always used. There was no real combination of the operation of the four tools. It was an aggregation not different from a successive use by an operator of hand tools, and so the Circuit Court of Appeals of the Sixth Circuit held. This was what led to the disclaimer of eight of the claims. It possibly gave the change in the character of the record and proof in this case from that in the Sixth Circuit as remarked upon by the Circuit Court of Appeals of the Third Circuit.

Eleven claims are left. While qualified by disclaimers, consideration of the original claims will serve our purpose. Claims 4, 5, 6 and 7 are for combinations of a sheet fabric supply, a power driven ring core, a radially moving support laterally spring pressed toward the core, with a spinning roll mounted on the support to shape the sheeted fabric to the core. The variety in the claims is in adding to the spinning roll the element of a receding angle to the place of the core in the 5th, in giving the spinning roll a round disk shaped edge in the 6th, in giving both the receding angle and the disk shaped edge to the spinning roll in the 7th.

Claims 12 and 13 comprise in their combinations all the above and the slow speed mechanism for actuating the core when the fabric is received from the stock roll, and the high speed mechanism for the spinning rolls to pass over the fabric on the core and shape it.

Claims 22, 23, 24, 25 and 26 cover the same combinations save that they emphasize the feature of the radially moving support of the spinning roll which is power pressed toward the core.

NO NOVELTY INVOLVED

There was no novelty in the combination of a power-operated core with fabric rolls for delivering the rubber impregnated strips through tension rolls to the core, or in the use of pressure rolls to stretch and press the thread at the slow speed of the core followed by the spinning of the stretching or spinning rolls with high speed down the sides from the outer line of the tread to the bead edge of the fabric, or in the use of the tangential force upon the skirts of the fabric to keep them away from the core. The use of power to revolve the core was seen in earlier patents in Seiberling and Stevens, in Vincent, and in the Belgian Mathern. The change of gears from slow to rapid revolution by shifting of the gears was shown in the first and third of these. The receding angle of the spinning roller to the plane of the core was not new with State. It was seen in Seiberling and Stevens.

The operation of the spinning wheel in the State patent is said to be automatic. We do not find it to be so. It is partly automatic in that the spinning rolls when properly placed, are brought closer to the fabric by the springs. The Belgian Mathern device is partly automatic in an analogous way. But when the process of spinning is carried to its completion, the adjustment and pressure of the wheels to the fabric as it approaches the bead edge, need the hand of the operator just as in the hand-making of tires. It is true that the spinning rolls in all these patents are steadied against the fabric in one way or another, as by the power pressed radially moving support in the State patent; but in the end the hand is needed to complete the spinning process as it nears the bead edge. We do not think that the use of the springs by State in such a combination involves patentable invention when we weigh its inconsiderable importance and note the suggestion of the use of such springs for analogous purposes in Vincent, and in Seiberling and Stevens.

NO SUBSTANTIAL CHANGE IN METHOD

The change from hand to the use of machinery often involves invention. In the making of tires, it has in fact resulted because of the use of power, in speed of manufacture and possibly in some greater uniformity of the product. But the record does not show that there has been sub-

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U. S. RUBBER REPORTS GOOD OUTLOOK FOR 1924

According to a statement made to stockholders of the United States Rubber Co. at the annual meeting held April 15, the earnings for the first quarter of 1924 are satisfactory. C. B. Seger, president of the company, said the quarterly dividend on the preferred stock had been earned by a fair margin, after all charges and reserves for depreciation. Mr. Seger said that the outlook for continued improvement in the rubber tire business was encouraging. Sales for the first quarter of the year, he added, are usually light, due to the seasonal nature of the company's business, but improvements in sales is expected in the future.

Regarding operations during the past year and the annual report recently submitted to stockholders. Mr. Seger said the company entered the year 1924 in a strong financial position. This, he said, is evidenced by the fact that the accounts and notes receivable from customers approximated $44,000,000 after deducting reserves for doubtful accounts or an amount equal to $6,000,000 more than bank loans. With cash holdings about equal accounts payable, the company is virtually without current debts. The inventory account, valued at $67,000,000, he said, was conservative as to quantities and values, all obsolete items having been eliminated. The only possible exception, he said, was goods in foreign branches the value of which depends upon the condition of the foreign markets. The management, he said, expected substantial improvement in the tire business during 1924, and if the improvement reported in the first quarter of the year continues, the outlook "is encouraging."

No Kelly-Springfield Dividend

Directors of the Kelly-Springfield Tire Co. at a meeting April 15 omitted the payment of the quarterly dividend of 2 per cent on the 8 per cent preferred stock. This is the first cumulative dividend to be passed upon this issue since Nov. 15, 1919.

I.R.I. Diploma Plan

A scheme for the granting of diplomas has been approved by the Council of the Institute of Rubber Industry, as follows: Diploma members are divided into associates and fellows. Under the first classification are reclassified general rubber technologists, chemists, physicists, mechanical engineers and electrical engineers. Diplomas awarded to members of this classification are: Technology—A.I.R.I. (Tech.); Science (Chemistry and Physics)—A.I.R.I. (Sc.); Engineering—A.I.R.I. (Eng.). Three sets of examination papers are used in deciding these awards.

After three years an associate is eligible for election to a fellowship, provided he has attained a satisfactory position in the industry. For a period of three years or more after the institution of the diploma, any individual holding an important position in the Institution, or who has published a work of exceptional merit, or who has been of signal service to the Institution and has been associated with it for a period of ten years, shall be eligible as a candidate for the fellowship without passing the examination for associates.

CLEVELAND TIRE DEALERS REJOIN NATIONAL ASS'N

Omaha and Trenton tire dealers are the latest to become affiliated in a body with the National Tire Dealers' Association. In addition to these developments, the Cleveland Tire Dealers' Association has rejoined the National Association. Several cities in the Middle West and on the Pacific Coast are expected to join the National body shortly, as local associations are now in the process of formation.

President George J. Burger reported that the efforts made by the National Tire Dealers' Association to determine the quantity of tire stocks carried by dealers throughout the country have brought many inquiries and individual membership applications to National Headquarters at 242 West 56th Street, New York City.

Original report of the National Tire Dealers' Association showing that the dealers had on hand on January 1, 1924, approximately twenty million tires was questioned at that time, but now tire executives admit that this estimate correctly describes the situation.

During the last three months, dealers' inventories have been reduced, according to the N.T.D.A.

GOODRICH STOCKHOLDERS RE-ELECT ALL DIRECTORS

At the annual meeting of the stockholders of The B. F. Goodrich Company, held April 16, all directors whose term of office expired were re-elected. The stockholders also voted to reduce the authorized but unissued common stock by 750,000 shares and to retire 11,880 shares of preferred stock in accordance with the charter provisions.

At the regular directors' meeting which followed, officers were re-elected without change. The regular quarterly dividend on the preferred stock of $1.75 per share was declared, payable July 1, 1924, to stockholders of record June 21, 1924.

President Work stated that while it has never been the policy of the company nor of the present management to look into the future and propheey results, it seems advisable, in the interests of the stockholders, to depart from this general rule at this particular time. "As everybody knows, the rubber industry as a whole has been passing through a period of depression during the past few years, and our company suffered with the rest. The turn of the year brought a substantial improvement to the industry, and judged by the results of the first three months operations of our company, the management ventures to predict that we may look forward to the future with confidence."

The estimated earnings for the first quarter were considerably in excess of bond interest and preferred dividend requirements.

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(Continued from preceding page)

stantial change in the mechanics or method of making. The steps are the same and the succession from one to the other are as in the manual art, and the transfer from hand to power was by the usual appliances and had all been indicated before the State patent.

These conclusions as to the lack of novelty in the elements and combinations of the State patent were reached by the Circuit Court of Appeals for the Sixth Circuit and we agree with them.

The majority opinion of the Third Circuit Court of Appeals in this case attributed much importance and novelty to the effect of the centrifugal force of the revolving core upon the fabric. Its view was that State had discovered that the fabric was thus substantially stretched radially as the spinning wheels hinged against the flowing fabric, and the square meshes on the sides were elongated substantially by the centrifugal force so that at the bead they were lozenge shaped and easily smoothed. We do not find such a new result, or anything different from what was shown in the making of tires by hand. If there were such a newly-developed, substantial addition to the stretching of the material by tangential force, it must have occurred in the Mathern Belgian patent before State. But we find it in neither. The discovery of such a new source of radial stretching power is not testified to by the experts in either hearing.

We are pressed with the argument that many tires, reaching into the millions, have been made under a license granted by Seiberling, and that the success of the device shows the utility and novelty of what he licensed. He gave to his licensees not only the use of State patent but also that of Seiberling and Stevens patent. Both patents made large and sweeping claims which were well calculated to induce acquiescence by those without sufficient knowledge of the prior art, or adequate capital to resist. Yet the more comprehensive claims of the State patent have now been disclaimed and the Seiberling and Stevens patent included in his licenses has been abandoned. There has been a complete change about in the Third Circuit law suit. Mr. Seiberling, when these licenses were granted, was at the head of the great Goodyear Company. He could give great vogue to a device owned and used by him. The license was not a heavy tax, equal to less than one percent of the cost of a machine, and purchase of peace was a wise course for the smaller manufacturer. Evidence of this kind is often very persuasive, especially when patentable novelty is in douts. *Potts* v. *Creager*, 155 U. S. 597, 609; *Magowan* v. *New York Belting Company*, 141 U. S. 332, 343; But it is by no means conclusive and must be weighed in the light of all the circumstances, to accord to it its proper significance. *Eibel Co.* v. *Paper Company*. 261 U S. 45, 56; *McClain* v. *Ortmayer*, 141 U. S. 419, 428. In the case before us, we do not think it can overcome the lack of novelty and invention.

Seiberling disclaimed combination claims of 4, 5, 6 and 7, except when constructed and coordinated in a certain way. He disclaimed claims 12 and 13 except for the combined operations of a certain kind and unless the recited elements were constructed and coordinated as he described. He disclaimed claims 22, 23, 24, 25 and 26, except when constructed and coordinated for a particular purpose and unless the power drive functioned as he pointed out. As we have found that there is nothing really new in the method or mechanism of State, it will serve no purpose to go through the qualifying disclaimers in detail and consider their effect.

The disclaimers are attacked on the ground that they exceed the legal function of a disclaimer and are an attempt to change a mechanical patent to a process or method patent, something which could only be properly accomplished by a reissue. The Circuit Court of Appeals for the Sixth Circuit examined the possibility of sustaining the alleged invention of State as a process or method patent but concluded that it was fully anticipated by the method of making tires by hand. We do not find it necessary to pass upon the validity of the method of making disclaimers here pursued, because we agree with the Sixth Circuit Court in failing to find invention in the State device either as a mechanical or as a method patent.

The decree of the Circuit Court of Appeals is reversed and the case is remanded to the District Court with directions to dismiss the bill.

Can Mechanical Features of Rubber Goods Qualify as Trade-Marks?

Test Case Brought by Goodyear Has Been Appealed from Patent Office to the U. S. Court of Appeals

(Written Especially for THE RUBBER AGE)

By Waldon Fawcett

UNDERGOING the acid test at Washington just at the moment is an issue the outcome of which will have vast and far-reaching influence upon production practice and sales practice in the rubber industry. More especially, it is the tire division of the industry that is concerned because the test has to do specifically with tires. But in only slightly less degree is the principle here involved of moment to all products of rubber which, for the sake of reputation and repeat orders, it is desirable to distinguish or identify to the trade and to ultimate consumers.

Should the tread pattern of an automobile tire be eligible for protection as a trade-mark? Or, to put it a bit more broadly, can a mechanical feature or a structural feature of rubber goods find its principal purpose and use as a vehicle of identification? Here is a moot question that has, at last, been fairly joined before the highest Federal authorities. And the entire rubber industry awaits the verdict with interest. Because, if the answer be in the affirmative, it will mean a new concession, a fresh property right that will all but revolutionize branding practice in the rubber industry.

There is no desire to pretend that it is only at this late day that manufacturers of rubber goods have hit upon the idea of drafting a structural part of a rubber specialty to serve as a trade-mark. In the tire trade, particularly, it has, from time out of mind, been the dream of marketers to get formal recognition for tread designs as trade-marks. Everybody who has paid any heed to the matter jolly well knows that, in practical operation, it is the tread designs that enable recognition of tires whether the goods be on display in stores or the clue be taken from the impress in the mud or dust of the road. Investigations have shown, indeed, that in the purchase of tires, nine out of ten citizens are guided solely by the familiar tread designs and pay little or no heed to the markings on the side walls.

In spite of the fact that tread corrugations have been serving all the practical purposes of trade-marks, the authorities at the U. S. Patent Office have steadfastly refused to issue Federal credentials to tread-marks. They have insisted that whatever protection against imitation and infringement is due original tread patterns must be obtained via design patents. This, too, in the face of the fact that design patents are supposed to cover ornamental features of articles of commerce. And whatever the duty of a tread design it is something more than mere ornamentation. However, all the history of Patent Office policy and law interpretation requires the exclusion from the trade-mark register of the "form of an article," or any part of the article, or a functional feature. All this is in compliance with the theory that the thing that is trade-marked cannot itself be the trade-mark. And the government's trade-mark censors have stuck to this tradition in the case of tire treads, even though it was shown time and again, by the testimony of the trade that tread embossings have a trade-mark use.

Time and again leaders in the rubber industry have protested at the Patent Office against denial of trade-mark status to tread "inscriptions" but always until now they have bowed to the inevitable. It has remained for the Goodyear Tire and Rubber Company to challenge the traditions of the Patent Office and to stage an epoch-marking test case that has already been appealed from the Patent Office to the U. S. Court of Appeals at Washington and that may ultimately make its way to the Supreme Court of the United States. Inasmuch as it is recognized that Goodyear is, in effect, fighting the battle of the entire industry in this instance, several other rubber companies are arranging to make common cause.

As a prelude to the present fight to win a trade-mark pedigree for its diamond tread, the Goodyear Company succeeded, after a struggle, in obtaining registration at the Trade-Mark Division of the tire imprint,—that is to say a representation approximating the impression that would be made upon paper if the diamond tread were coated with ink and used as a rubber stamp. That was a worth-while first step in the progress to broader branding rights in tiredom but it left much yet to be desired. For one thing, the requirement that a registered trade-mark shall be used on the goods makes it necessary to support the registration already obtained by affixing paper labels or wrappers bearing the diamond imprint which has been accepted. Furthermore the imprint which has thus

Tread-Marks as Trade-Marks

The rubber industry is at last to have a decision from the U. S. Circuit Court of Appeals on the moot question of the utilization of certain mechanical feaures of rubber goods as trade-marks, of which tire treads are an outstanding example. For many years countless motorists have purchased their tires on the appearance of the tread; they knew by hearsay and their own experience that certain treads were associated with long-wearing qualities. Despite the fact that these treads have for years been serving as trade marks to all practical purposes, the United States Patent Office has steadfastly refused to consider them as such and issue trade-mark credentials. The design of treads can be patented, of course, but the use of the tread as a trade-mark by the manufacturer is not at present permissible.

The outcome of this interesting legal fight for trade-mark recognition of treads and other mechanical features of rubber goods will be of great interest not only to tire manufacturers but the whole industry.

gained trade-mark standing is, in a sense, the reverse of the tread design that has been transferred. It is, in effect what the photographer or moving picture man would call a positive whereas the rubber manufacturer desires to center his protection on the negative, which is what the purchasing public sees as it looks at the tire itself.

Shortcomings of Design Patent System

Chief incentive for this fight to obtain full-fledged trade-mark recognition for tread designs is to be found in certain shortcomings of the design patent system. In so far as one specific design is concerned, a design patent will afford a certain amount of protection,—though, even at that a patent placard is not as effective a warning to trespassers as is a notice of trade-mark registration. But the worst of it is that if a trailer comes along with any variation or modification of a patented design that is not a brazen copy he may obtain a patent for his near-double. Thus it becomes necessary, in order to even half way protect a cherished tread design, to take out patents on complimentary patterns representing all the changes that might readily be rung on the basic model. Indeed, the Goodyear Company, in order to safeguard its diamond tread has already made considerable expenditure to patent all the obvious alternatives of the diamond design.

In contrast to the narrow limitations of a design patent, behold the broad protection of a trade-mark registration. Given the acceptance of a design as a trade-mark and the Federal authorities make it their business to not only debar duplicates but they keep at arm's length all similar marks that bear such resemblance to the pioneer design that they would be liable to cause mistakes on the part of the purchasing public or induce confusion in trade. It is no wonder that rubber manufacturers, doomed to the narrow grooves of protection via design patent, have looked longingly at the blanket shelter afforded by trade-mark registration. Even though a tire manufacturer has been confirmed by Uncle Sam in his possession of various other trade-marks,—say the marks used on side walls, on paper wrappers, on tube boxes and what not, he remains unsatisfied under the denial of tread countenance because that is the identifying medium upon which the public mainly relies.

To those who know the lay of the land, it has come as no shock or surprise that the Goodyear Tire and Rubber Company has lost the first skirmish in its fight to vindicate tread designs as working trade-marks. The arbiters at the trade-mark clearing house took refuge in technicalities as well as in tradition. For example, there is a requirement that a trade-mark must, at the time of its original adoption, have been requisitioned for the purpose of indicating origin, manufacture or ownership of the marked goods. The head of the Patent Office told the Goodyear Company that there was no evidence to show nor no reason to suppose that its diamond tread design was originally adopted solely for trade-mark purposes.

The chief umpire at the Patent Office has supported his subordinate, the Examiner of Trade-Marks in the assumption that the purpose of the out-standing blocks or elements of the diamond tread design is a mechanical one, viz preventing the skidding or slipping of the tire. The reviewing authority acknowledged that, in the rubber trade, and in some other lines, there are many features about the manufactured products which may become more or less characteristic of the output of a certain manufacturer but he insisted that these features, inherent in the article itself and performing mechanical function in the use of the article, do not constitute subjects for trade-mark registration.

What, more than anything else, has given the Goodyear Company courage to attempt to overturn the traditional limitations upon the trade-marking of tread designs is the attitude manifested by the higher U. S. courts with respect to the marking of horse shoe nails. Now if there are any products which would seem to be far apart and ought to be kept apart it is nails and tires. But, as it happens there is in the technique of branding a deadly parallel between the two test commodities. Because, the issue in the horse nail case was recognition as a trade-mark of a criss-cross pattern on the nails, similar in its appearance to the check figure presented by the diamond tread.

The Federal judges who sat in judgment on the horse nail case declared that because the figure formed by intersecting lines on the face of the article was an ornamental device which added to the appearance of the article it was not prevented from also operating as a valid trade-mark. The court further declared in this instance that the fact that a trade-mark is cut or stamped into an article itself does not affect its validity as a mark. That causes the Goodyear Company to believe that it has a fighting chance to liberalize trade-mark practice, even though the Court of Appeals at Washington, where it is now staging a show-down, once declared with respect to rubber roofing material that a design of cross lines forming squares and embossed or indented into the roofing was a mere structural feature of the goods and did not constitute a trade-mark.

The Goodyear Plea

Especially will the Goodyear Company stake its fight on the issue that—according to the appraisal at the Patent Office—the diamond tread is a mechanical feature serving a utilitarian purpose. The plea will be made that under prevailing practice in the tire industry the non-skid equation is a subordinate one. Even if the tread does, for a time, lessen the liability of slipping, that service is overshadowed by its dominant function as a trade-mark. This relationship is emphasized as the tire is subjected to service. As the Goodyear representatives set forth, the last vestige of gripping quality may disappear as the tread blocks are worn down and yet there will remain, in that portion of the tread which makes least contact with the road surface, a remnant of the design that will endure to the very end of the natural life of the tire as a trade-mark to identify its origin and manufacture. If the voice of the trade has any weight in imposing practical considerations above technical rules it will make itself felt, for the Goodyear people are piling up at Washington no end of testimony from distributers and dealers covering actual instances in which buyers have specified their wants solely by tread characteristics. It will probably be late in 1924 or perhaps early in 1925 before the fate of tread designs as trade-marks is finally decided. In the meantime, there is satisfaction in the knowledge that the stage has been set with utmost care for this test, the Goodyear Company having put forward as its candidate a design just enough different from the most commonly used and best known version of the familiar patented diamond tread design to make sure that the test can concern itself with a unique and original pattern.

How to Protect a Business Slogan or Trademark

By Elton J. Buckley*

I am quite frequently asked by business men of all grades how they can protect some mark or design, or slogan, or motto which they have adopted and which by long use has either become or will become, characteristic of their business. For instance, take the following, which comes to me from the State of Washington:—

I have been unable to get a satisfactory answer to a certain question from my attorney, hence I am asking you.

I have a two-word slogan or trade-mark that I wish to use in advertising and want to protect same by copyright if possible. The Registrar of Copyrights tells me that I cannot copyright a slogan, but I can copyright a trade-mark. Just what is the difference and what is the procedure? I wish to use this slogan in the same manner in which the Pacific States Electric Co. (General Electric Co.) are using their "Check Seal" trade-mark on all the mer-

*(Copyright, March, 1924, by Elton J. Buckley, Esq., 643 Land Title Building, Philadelphia, Pa.)

chandise they sell, as a personal guarantee of quality. Can I copyright it or not?

I have written this correspondent direct, so that this article will be a general discussion of the subject rather than a specific answer to his query.

Various Federal laws give different kinds of protection to different expressions of originality or ingenuity on the part of business or professional men. First the patent laws, which I need not discuss, as they have no bearing on the subject. Second the copyright laws, and I needn't discuss those either, for the business man can't copyright slogans or labels, or mottoes, or catch words or phrases, or anything like them. The laws which apply to my subject are the trade-mark laws and the law allowing the registration of prints and labels in the patent office.

With this preliminary, let me take up the various things which a business man might want to protect, and tell how each would be done.

First, suppose he is a shoe man and has devised a label made up like this: around it is a border in the form of a keystone, and inside is a picture of a shoe. Over the shoe is the word "Sure" and under the shoe the word "Fit." He uses that label on all of his shoes and it has become an associated trade-mark. He wants to protect it—how shall he go about it? He can do it in either of two ways: First, he can register his label in the patent office under the Act of 1874, which allows the registration in the patent office of prints and labels. The word "prints," let me say in passing, means something used in connection with a business other than a label. It might mean an advertisement, or a poster, or something like that.

The second way to protect the Sure Fit Shoe label is to trade-mark it. That is, to get trade-mark registration for it in the patent office. This protects the form and design of the label only; it does not protect the words "Sure Fit," for they are descriptive words, and the law says descriptive words can't be trade-marked. To be sure he can get a sort of trade-mark registration for them under the later Act of 1920, which practically allows anything to be trade-marked, but nobody pays much attention to that act, because it is so loose that it really doesn't give any real protection. Most people proceed under the Act of 1905.

Let me explain what I mean by descriptive words which can't be trade-marked so as to prevent other people from using them. You already have one illustration, "sure fit." Some others are "cream of ice cream" for ice cream; "easy set" for a metal window frame sash; "interlox" for packing goods, mailing bags, etc.; "just right" for roofing material; "u-put-on" for rubber heels, and so on. All these have been held to be descriptive and trade-mark registration (i. e., under the Act of 1905) refused on that account. Remember, however, that the label or the print containing them can still be registered in the patent office as I have described.

A few examples of words that have been held non-descriptive and therefore open to trade-mark registration are "Dutch Dainties" for candy; "Hog Tone" for a hog tonic; "Kiddies' Kicks" for children's shoes; "Lids for Kids" for children's hats; "Trucker" for flour, etc.

In a nutshell, you can't get trade-mark registration, and with it the right to keep other people from using them, for ordinary combinations of words. I couldn't trade-mark the phrase "Delicious Ice Cream," for instance, because delicious is descriptive and everybody's property. I might get another form of protection for it, however, which I will explain in a minute.

Trade-marked registration can always be obtained for coined words and expressions, however, "Uneeda" is a good example. "Mulsified" is another. The word "Tencenteria," meaning 10-cent store, was recently trade-marked. "Acido" was also. "Nuctone," a hair dye, is another case.

Ordinarily so-called "clever" mottoes can only be protected by registering the label or the print containing them. They can't be trade-marked. For instance, the following were recently registered: "Bluebirds for Happiness" (liver pills); "Yes we have no bananas, but we do know how to print," and "It's pure, that's sure." None of these could have been trade-marked.

Finally there is one form of protection which comes to a business man using a slogan or a motto or a design or something like that, without doing anything to get it except using the particular thing in connection with his business. That is under the law of unfair competition. This is entirely separate and distinct from any questions of trade-mark or registration. The principle of it is that a man who has used *anything* in connection with his business so persistently that it has become characteristic of it, can protect it against everybody else, even though it was not entitled to trade-mark registration or the other form of registration. It might be no more than a red color for his label. Suppose for instance that I adopted the time-worn phrase "Oh, my!" as a slogan, putting it on all my packages and all my labels. I couldn't get any adequate protection for those words through the patent office, but after I had used them so long as to tie them up to my product, I could prevent anybody else from using them in the same way, on the theory that the public might become confused between the two products.

Editor's Review Desk

LEAD: THE PRECIOUS METAL. By O. C. Harn. 323 pp. including an index. Illustrated. The Century Company, New York, N. Y. $3.00.

This volume, the latest addition to the series published by The Century Company, dealing in a popular way with drugs, rubber, artificial light, cement and concrete, is written by the advertising manager of the National Lead Company, who has been in a position to study lead from the point of view of the layman, the user and the consumer. It is not intended to be a book upon which industrial work in lead may be based but is designed to appeal to the reader who takes a special interest in the wide utilization of this metal. Chapter XX is devoted to the use of lead in rubber; it is pointed out by the author that one class of rubber goods contains a greater percentage of lead than many of the commoner articles. He has reference to the rubber clothing used by X-ray operators as a protection from the ill effects of continued exposure to the penetrating rays. Hoods, gloves and aprons worn in X-ray work contain as much as 60 per cent of lead, he says, whereas ordinary rubber clothing contains but from ten to fifteen per cent.

Lead compounds cannot be used as accelerators when white rubber goods of a pure tone are desired because the lead would unite with the sulphur used in vulcanization to produce lead sulphide, a black compound. Not all manufactured rubber contains lead but a great many commercial articles do contain a percentage of a compound of this metal in varying proportions.

The author follows the story of lead from the mine, through the refining processes and into its many uses. The book is one of the most comprehensive popular compendium of facts about lead yet published.

* * *

SCOTT TESTERS. Henry L. Scott & Co., Providence, R. I. 8¾ x 11¼. Bound in loose leaf form; 28 pp. printed on coated paper; halftone illustrations.

This is a comprehensive catalog that features apparatus for testing textiles, rubber, et cetera. One machine for testing rubber is described in great detail; it is claimed that it embodies devices not found in earlier types and is manufactured along lines peculiar to the company. The description of the rubber and fabric tester is also interesting because in the manufacture of mechanical rubber goods, it is often economical to test both rubber and fabric on the same machine.

The Manufacture of Hard Rubber

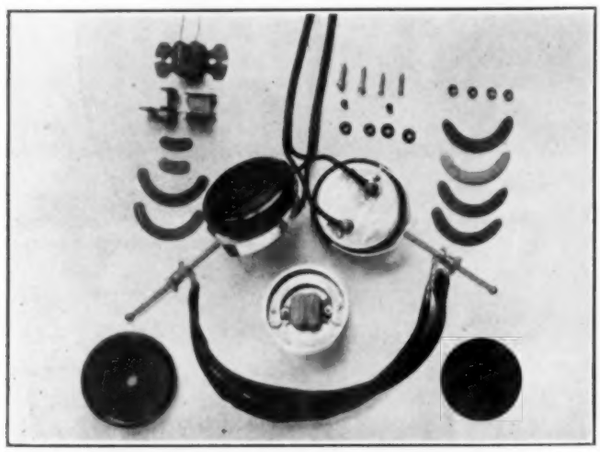
Commodity Finds a Wide Use in Radio Parts, Dentures, Battery Boxes, Steering Wheels and Druggists' Sundries

By H. T. Tenen

THE hard rubber industry has seen tremendous development within recent years. The demand for hard rubber goods of all sorts has been steadily increasing. This is a condition which seems to hold good throughout most of the rubber manufacturing countries, such as Germany, France and England, besides the United States. There are numberless products made from hard rubber and from hard rubber plates or sheets, tubes and rods, as well as directly from the raw rubber itself. The development of radio has opened up another field for the use of hard rubber. Panels, dials, parts of transformers, variometers, vario-couplers, and other devices used in a radio set are usually made from hard rubber. The radio industry is growing, and its growth is bound to be reflected in an increased consumption of hard rubber for radio purposes. It is needless to cite the advantages of hard rubber, its strength, ease of machining and working into various shapes and forms, its high dielectric strength, the fine finish it takes and its resistance to the effects of the atmosphere as well as to many acids, alkalies and chemicals, all of which make it a very desirable product for a great many purposes, too numerous to mention.

Therefore, it should not seem amiss to consider a few of the underlying principles which are concerned in the manufacture of hard rubber. It also appears advisable to give here a few of the details, they might be called practical tricks—which have been of great service in the regular routine of the manufacturing process as carried on in Germany and other European countries.

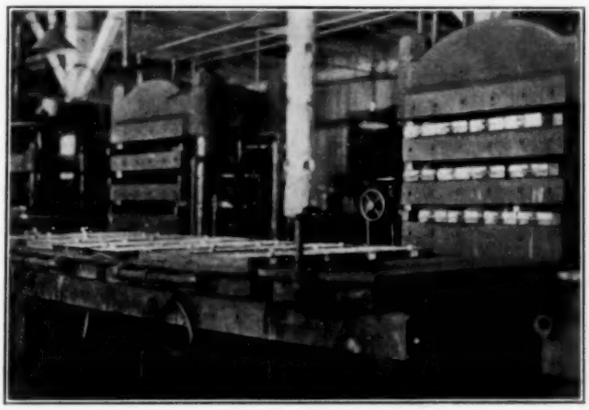
There are three prime essentials in the manufacture of hard rubber which must be given careful attention, if a good product is to be obtained. The first is that the raw rubber is absolutely dry before it is brought to the mixing machines for compounding with other ingredients. If not dry, it should be carefully dried. This same condition applies to the other materials which are used in compounding the rubber batch. Thus, the sulphur, the filling materials and the pigments must be in a perfectly dry condition. Second, they should be finely ground. Third, the mixing operation must be carried out so thoroughly that the mixture appears absolutely homogeneous to the naked eye. The eye must not be able to distinguish any of the ingredients of the mixture.



C. Brandes, Inc., N. Y.

Hard Rubber in Radio

Above is Shown Only One Use of Hard Rubber in Radio. The Caps on the Ear Pieces are of Hard Rubber. Hard Rubber is Also Used in the Bases of Loud Speaker Horns, in Panels, Sockets, Vario-Couplers, Dials, Variometers, etc.



Connecticut Hard Rubber Co.

Section of Hard Rubber Molding Room

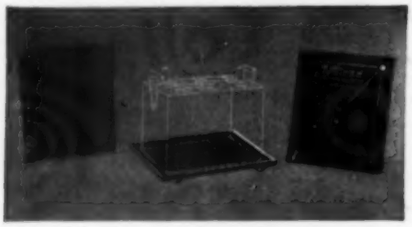
A large quantity of hard rubber plates and sheets are consumed in making various rubber merchandise. These are staple products. In their manufacture there are certain precautions to be taken in order to secure a proper quality of product. After the rubber has been thoroughly mixed on the machine, it is run out in a film about one fiftieth to one twenty-fifth of an inch in thickness. The required thickness of the plate or sheet is then built up from this film by repeated folding of the same. This is done on the calender rolls. One very essential detail, which requires careful attention at this point, is the prevention of the formation of air bubbles between the layers of the rubber film. It is comparatively easy for air to be imprisoned in this manner and if the bubbles remain, a plate of rather low mechanical strength is obtained. Wherever and whenever a bubble of air forms, it must be pricked to allow the air to escape. When a thick rubber plate is built up in this manner, it is unadvisable to use a rubber solution to bind the individual rubber films together. Generally the only binding action between the films is that obtained from compressing the raw rubber.

After the proper thickness of sheet has been obtained, the latter is removed from the calenders to the hot table. This table is of ordinary construction and is heated by steam pipes underneath the top surface. The size of the table may vary but whatever the size, the top must be perfectly smooth and it must also be evenly heated over its entire surface. The purpose of this table is stated to be the warming-up of the rubber sheets so that they attain the proper consistency before they are introduced into the vulcanizing apparatus.

The vulcanization process may be carried out in two ways. It may take place in the common type of press or else it may be effected by use of the water bath.

Vulcanization by the Hot Press Method

In the latter process the sheets are first cut to size and then are covered with paper which is as thin as possible and still possesses the requisite stiffness. The sheet is then placed in a frame made of wrought iron, which must be of the same thickness and inside dimensions as the sheet of plastic rubber. The purpose of this frame is to prevent the sheet from being squeezed out to greater size than desired, and it enables the



Vulcan Rubber Co.

Hard Rubber Battery Tray

To Prevent Damage to Surrounding Articles Such as Rugs, etc., by the Acid Electrolyte in Radio Batteries is the Purpose of the Tray Pictured Above.

operator to secure a product of absolutely fixed dimensions. It is also important that the surfaces of the press be absolutely smooth and if this is not so, then sheet steel plates may be put over the frame so that a perfectly smooth surface comes in contact with the sheet of rubber. After the vulcanization process is completed, the sheet of paper which was placed over the rubber sheet is removed by stripping with a knife and the use of a little water.

The surfaces of the sheets that are obtained by this process of vulcanization have a dull appearance. Rubber sheets possessing a glossy surface can be obtained by the water bath method of vulcanization.

Vulcanization by the Water Bath Method

This process is well suited for producing hard rubber products with a high gloss. The warmed rubber sheet is wiped off with a woolen cloth which has been dipped in linseed oil. Then the surface of the rubber is covered with highly polished tin-foil, about 0.4 of a millimeter thick. The tin-foil is rolled into the surface of the rubber by the aid of a heavy iron roller. One thing that must be guarded against is the formation or inclusion of air bubbles between the tinfoil and the rubber. This is circumvented by careful rolling. Both sides of the rubber sheet are treated in the same manner.

The tinfoil which projects out on all four sides of the sheet is coated with a little rubber solution and then the ends are lapped over and pressed together so that the entire sheet of rubber is covered with the foil. The tin-foil covered rubber sheets are then placed one on top of the other in the vulcanizing chamebr and vulcanized. The tin-foil is then removed and may be used over again if it is not injured in the removal process. If it is, then it may be rolled out again into sheets.

As has been mentioned the important thing is to see that no air or water gets in between the tin-foil and the rubber. If that happens, brown spots are formed on the surface of the rubber. The only way in which to remove these spots is to grind them off mechanically. In order to make sure that all of the tin has been stripped from the rubber, it is advisable to wash the surface of the ebonite sheet with a little nitric acid which dissolves the metal. The products that are made in this manner possesses surfaces of comparatively high lustre, but this can be further materially increased by mechanical treatment.

Increasing Lustre by Mechanical Treatment

The first step in this process is to remove all irregularities in the surface by means of fine emery paper and then the ebonite sheet is polished by rubbing against a rotating pulley which is covered with a soft cloth. Powdered pumice and water are used as the abrasive. Then the pumice is removed and the process is repeated on another polishing machine in which the polishing surface is covered with a soft flannel. In this case a fine grade of Tripoli powder is used as the abrasive in the place of the powdered pumice stone. The former is then removed by washing with water. The ebonite sheet now possesses a high lustre, which may be even further increased by buffing with a suitable wheel, using a little absolute alcohol as the lubricant. In all this treatment it is of course of prime importance to see that the rubber surface is not unduly heated up. The pressure that is applied in the buffing and polishing operations must be as light as possible.

Another way of polishing ebonite plates is to pass them through specially designed polishing machines in which the sheets are passed back and forth between polishing rolls. The ebonite sheets are first covered with a polishing paste which is made from soft stearin, rouge and the very finest grade of emery dust. The sheet is then buffed with a wheel which is covered with felt. The abrasive is then removed and the buffing operation is repeated with the aid of a little benzine which is first rubbed lightly over the sheet. The polishing is then continued with a paste consisting of soft stearin, Vienna chalk and rouge. In this case a flannel-covered wheel is employed. A very high polish is produced in this manner. This polishing process is applicable to ebonite sheets which have been vulcanized between tin foil.

In polishing ebonite sheets which have been vulcanized in the press, a more strenuous treatment is used. Both coarse and fine emery powders are employed in the polishing operation. Then the regular treatment, as described above, is carried out.

Making Tubes and Rods

Besides plates and sheets, ebonite or hard rubber is mostly made in the form of tubes and rods. The rubber batch is mixed together in the usual manner and then it is rolled out

Davidson Rubber Co.

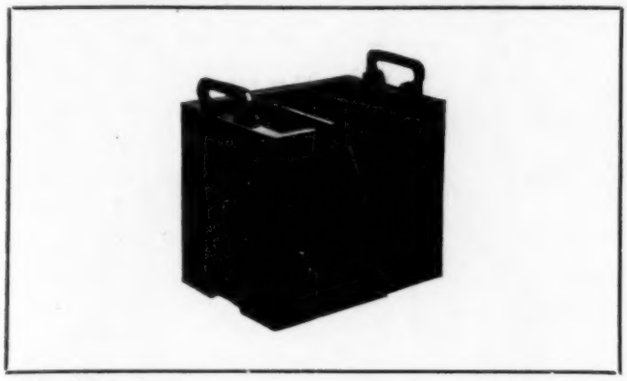
Combination Syringe and Water Bottle with Hard Rubber Screw Pipes and Connections

Hard Rubber Parts are also Used in the Davidson Line of Fountain Syringes and Syringe Sets.

into long strips. These strips are heated up on a hot table which has a temperature of approximately 50 degrees C and which is located near the tubing machine so that when the strips of rubber attain the desired degree of plasticity, they can immediately and directly be introduced into the machine for conversion into rods and tubes. It is aimed to conduct the tubing operation in a continuous manner so that one strip of rubber after the other is constantly being fed into the machine. When the operation is carried out in this manner, all danger of obtaining a product in which variations of thickness (diameter) occur or in which the strength and the

porosity are not constant are excluded. This might occur were the continuous process interrupted due to changes that may take place in the degree of pressure put on the material as it is being manufactured into rods and tubes in the machine.

One important condition in the manufacture of ebonite tubing and rods is the temperature at which the machine is operated. This varies in accordance with the proportion of



Vulcan Rubber Co.

Battery Case

A Hard Rubber Battery Case that Eliminates Damage caused by Leaking Jars. The Jars in the Case above are Built-in

oil that is contained in the rubber batch that is employed in the manufacturing process. The percentage of the oil in the rubber batch has an important bearing on the toughness of the same, and hence when the rubber is tough, a higher temperature must be employed than when it is soft. For tough rubber mixtures the temperature varies between 70 and 80 degrees C, which means that the finished rod or tube must possess that temperature as it emerges from the spraying nozzle of the machine. The temperature in the other parts of the machine may of course be lower than that.

In order to maintain these temperatures, it is advisable to heat the nozzle through which the rubber batch is squeezed by means of gas or electricity, while steam may be employed in heating the rest of the machine. It is also necessary to be able to control the heating so that the temperature is closely regulated within the prescribed limits. The importance of this point is evident to the rubber man for if the temperature in the machine is too high, vulcanization of the rubber might start in this step of the manufacturing process which would be detrimental to the quality of the product.

After the rods and tubes have emerged from the machine, they are coated over with a little French chalk and directly vulcanized. This applies to the rods only as the tubes must be placed on the proper sized mandrels so that their shape is maintained during the vulcanization process and they do not collapse. Steel or aluminum tubes are commonly employed for this purpose, and it is advisable to coat the mandrels with a little water glass solution before the rubber tubes are drawn over them.

The Vulcanization Process

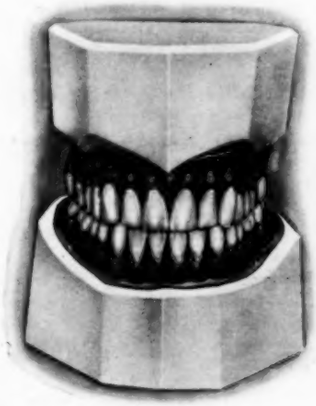
The vulcanization process is carried out in vulcanizing chambers in which the iron boxes, containing the rods or tubes, are placed. These boxes are filled with French chalk which prevents the rods and tubes from sticking together. A good quality of chalk should be employed for this purpose and it must be perfectly dry before being used. It is advisable to sift the chalk before its use in the vulcanization process and after each vulcanization operation. The rods and tubes are laid in regular layers in the box and should be separated from each other on all sides by a layer of French chalk.

In the manufacture of large sized tubes and rods, a rod or tube of smaller diameter is first made and then heated up and layers of rubber are built up around it until it attains the desired size. No solution need be used in this process for the heating of the rubber makes it sticky enough so that a firm union is obtained between the various layers. It is desirable of course that the adhesion between the rubber layers should be as great as possible and in order to increase the same it is customary to bind the article tightly with a damp linen strip and then vulcanize. This practice is identical to that which is usually employed in the manufacture of soft rubber articles. In the vulcanization of the large sized rubber rods and tubes, the built-up articles are placed in a vulcanizing box which is similarly filled with French chalk and the process is the same as that employed in vulcanizing the small-sized rubber rods and tubes. In the case of extremely large tubes and rods, it is necessary to employ special mandrels which are large enough to give products of the desired dimensions. It is important in this case as well as in others that the rubber product be removed from the mandrel while the latter is still warm. If it is allowed to cool off, difficulty will be found in stripping off the tubes without injuring them in some way.

Irregular-Shaped Ebonite Articles

There are a great number of articles that are made to advantage from hard rubber or ebonite. These may be shaped in all sorts of ways and may vary considerably in the complexity of their form. There are in general four different ways in which such merchandise may be manufactured, and the use of the particular process that may be employed in a certain instance depends to a large extent on the use to which the product is to be put and the ease with which it can be manufactured by the process employed. In many cases the processes are interchangeable and any one of the four may be employed in the manufacture of a specified article.

The first process consists in completely vulcanizing the article in molds. In the second process part of the vulcanization is carried out in molds and the rest of the process is free vulcanization. The third process consists in giving the article its desired shape by pressing in suitable molds and then vulcanizing the shaped article without molds. The last process consists in shaping the article by hand and then vulcanizing without molds.



S. S. White Dental Mfg. Co.

Hard Rubber in Dentistry

Above is Shown a Full Denture, Upper and Lower, Mounted upon the Plaster Model which the Dentist Makes of the Patient's Mouth. Other Articles of Hard Rubber Made by this Firm are Discs, Instrument Handles and Guards for Dam Holders

The molds that are employed in this process are generally made of iron or of composition metal containing lead. Before the rubber in the unvulcanized condition is added to the molds, the latter must be warmed up. The temperature is commonly raised to 80 degrees C. The temperature of the rubber itself must be in the neighborhood of 70 degrees C. Another precaution that must be taken in mold vulcanization is to see that the sides of the mold are coated with a suitable substance which will prevent the rubber from sticking to the metal and hence will permit the removal of the finished vulcanized article from the mold without any danger of injuring either the mold or the rubber article.

This coating material is really a sort of lubricant and many different preparations are employed for this purpose. One that is claimed to give excellent results is made up by dissolving 0.350 kilogram of soft soap and one kilogram of soda in four liters of water. Then the solution is heated to boiling, the froth is skimmed off and it is permitted to cool slightly. After that three quarters of a liter of alcohol is added. The solution is brushed over the hot mold and on drying it leaves a grayish colored deposit. It is essential that the coating be allowed to dry out thoroughly before the mold is filled.

In a plant where a great deal of rubber molding is carried out, the cost of the molds is quite an item. In order to make large productions of rubber goods, it is necessary to have a large number of molds on hand, all of the same design. If these molds were all made of iron, being accurately machined to size and made with great care so that merchandise of uniform shape and dimensions is manufactured, the cost would be excessive.

One method of getting around this difficulty is to make a master mold with great care from iron or steel and then make molds from this master mold by using a composition metal whose principal ingredient is lead. The lead molds can be used for a number of vulcanizations, but after a certain time they become worn and then they must be destroyed, the metal being melted and other molds made therefrom. In this way the cost of the manufacturing process is considerably reduced. It is suggested that a composition metal which is very well suited for this purpose can be made by mixing together 70 parts of lead, fifteen parts of tin and fifteen parts of antimony.

Details of the Vulcanization Process

The conditions under which the vulcanization of molded goods are carried out depend to a large extent on the ingredients that are mixed together to get the rubber batch, the size of the article that is being made and the use to which it is going to be placed. It is easy to see why the partial mold vulcanization process is preferred under most conditions to the straight mold vulcanization, for in the former process the molds are released after a preliminary vulcanization of the rubber article for a short period, about one to two hours. Then the rest of the vulcanization is continued in the open and the molds are available for use again. The free vulcanization process is carried out either by hot air or by using a double-walled vulcanizing apparatus. In the first case the articles are packed into iron boxes and then placed in the vulcanizing press. It is important that the rubber articles do not come into direct contact with the steam. The latter must be used to heat up the plates in the press through either the press platens of the jacket of the apparatus.

When the operation is carried out in the open, that is when vulcanization is effected on the articles after they are taken from the molds, direct steam may be employed only after the articles are imbedded in French chalk. The results that are obtained by both methods of vulcanization are the same, but either process will be used in accordance with local conditions, the nature of the equipment of the rubber works, etc.

In mold vulcanization it must be remembered that in this case just as in the vulcanization of rubber sheets and rods, the insertion of thin pieces of tin foil between the article and the mold results in a product of higher lustre with resulting reduction of subsequent polishing operations to a minimum. In using tin foil for this purpose, some of the metal may be recovered and used over again and the particles that adhere to the vulcanized article must be removed by treatment with nitric acid. When the molds are nickel plated, the same results are achieved as when tin foil is employed.

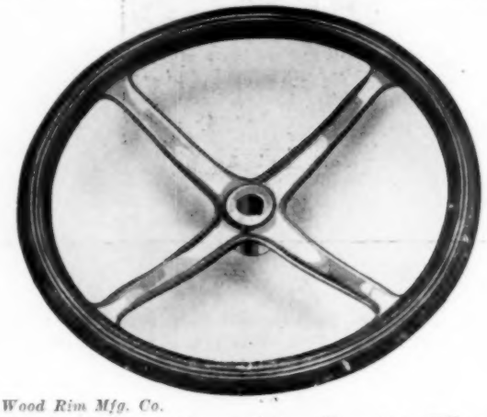
Vulcanization Without Molds

When the plastic rubber batch is shaped into molds under high pressure, the shaped articles may be removed from them and vulcanized in the open after having first been imbedded in French chalk. Tin foil may also be employed in the vulcanization process. In case the article is sheathed in tin foil it is unnecessary to imbed it in French chalk. This process of vulcanization is eminently suited for mass production of ebonite articles.

Occasionally a small order is obtained by a rubber works for an article which required an intricate mold. Under such conditions due to the high cost of making the mold, hand shaping is resorted to. The vulcanization is afterwards effected in French chalk. Considerable skill must be possessed by the operator who undertakes molding by hand. Aid is given by wrapping the article with linen bands.

Ebonite in the Chemical Industries

There are numerous articles manufactured from hard rubber and not of the slightest importance or least interest among these applications for hard rubber are the uses that it finds in the chemical industries. These uses depend on certain advantageous properties of hard rubber when it is employed in places where it comes in contact with acids and corrosive liquids.



Sheller Wood Rim Mfg. Co.

Hard Rubber Composition Steering Wheel

In the manufacture of hard rubber to be employed for chemical purposes, certain variations in the properties of the finished product may be effected by varying the composition of the ebonite. This may be done by adding different proportions of sulphur for vulcanization and also by the incorporation of filling and loading materials of various kinds. Careful consideration must be taken of the uses to which the finished products are going to be put in determining the percentages of the various materials that make up the rubber batch.

Some Properties of Hard Rubber

Hard rubber will possess a tensile strength of 1500 to 10,000 pounds per square inch and a resistance to compression of approximately 3000 to 20,000 pounds per square inch. The elongation will be between 2 and 75 per cent. The lower limit of the density of ebonite is 1.14 and average density is 1.20. Hard rubber begins to soften at a temperature of 70 to 80 degrees C with the exception of particularly hard grades. Hence chemical liquors at higher temperatures than 50 to 60 degrees C should not be allowed to come in contact with the rubber, for while it will withstand the corrosive action of the chemicals, the heat is liable to deform the hard rubber apparatus. The electrical resistance of hard rubber is extremely high, being twelve billion megohms per centimeter.

Hard rubber is not affected by the following chemicals: hydrochloric acid gas, phosphoric acid, hydrofluoric and hydrofluosilicic, sulphuric acid up to a density of 1.50, nitric acid up to a density of 1.12, hydrochloric acid in all proportions, caustic potash and caustic soda, chlorides, sulphates, etc., zinc chloride, ferric chloride, gaseous chlorine and other corrosive chemicals.

Hard rubber may be employed in the manufacture of various chemical apparatus such as piping, pipe fittings, cocks, valves, pumps, both of the piston and the centrifugal type in which all the different parts which come in contact with the corrosive liquors are made of solid hard rubber or of metal covered with a coating of hard rubber. Pumps with

(Continued on Page 62)

Government Specifications for Cotton Duck

SPECIFICATIONS for numbered cotton duck were adopted on Feb. 1, by the Federal Specifications Board and approved by the Cotton Duck Association as a result of tests made by the Bureau of Standards. The Specifications (No. 53) will apply to the purchases of cotton duck by the Departments and Independent Establishments of the Government are as follows;

Material

The duck shall be made of cotton thoroughly cleaned and free from waste. It shall be evenly woven without sizing, and shall be free from an excessive number of avoidable imperfections of manufacture.

Weave

The weave shall be plain.

Width

The average width shall be as specified with the following tolerances:

Widths up to and including—	Inch.
36 inches	—¼ to +¼
37 to 60 inches	—¼ to +⅜
61 to 80 inches	—⅜ to +⅝
81 to 120 inches	—⅜ to +¾

Weight

The requirements for weight shall be as given in the table below with a tolerance of 2½ per cent, plus or minus.

Construction and Count

The number of ply and the count (or number of threads per inch, warp and filling) shall not be uniformly less than shown in the table below. They may be exceeded in the discretion of the manufacturer. The allowable variation from the manufacturers' standard count shall not exceed, within a bolt or roll, for the WARP:

±1½ threads in fabrics counting not over 40 threads per inch;
±2 threads in fabrics counting over 40 threads per inch;

and for the Filling:

±1 thread in fabrics counting not over 25 threads per inch;
±1½ threads in fabrics counting from 25½ to 32 threads per inch;
±2 threads in fabrics counting over 32 threads per inch.

The count shall be determined by ascertaining the number of threads in 3 inches, taken consecutively, and reducing to terms of 1 inch. The warp count shall not be taken at less than 8 inches from either selvage for goods 26 inches or more in width; for goods under 26 inches it shall not be taken nearer the selvage than one-fourth of the entire width of the fabric.

Method of Testing

From each delivery of 1,000 yards or fraction thereof a sample of not more than 2 linear yards shall be cut from any part of at least two rolls for test purposes.

Tests may be made under prevailing atmospheric conditions, except in the settlement of disputes concerning weight and strength. Such tests shall then be made upon material having normal moisture content, obtained by exposure for at least four hours to an atmosphere of 65 per cent relative humidity at 70° F. temperature.

All tests for breaking strength shall be made on an approved type of inclination balance breaking machine. The maximum capacity of the machine shall be 800 pounds.

The 1 by 1 by 3 inches grab method of testing shall be used, defined as follows: The lower half of each pair of jaws shall be 2 inches or more in width and the upper half shall be 1 inch in width. Jaws shall be planed smooth and flat with edges slightly rounded to prevent cutting. The initial length of the test pieces between the jaws of the testing machine shall be 3 inches, and the pulling jaw shall travel at a uniform rate of 12 inches per minute. Six test pieces, 6 inches long by 4 inches wide, shall be cut, three in the direction of the warp and three in the direction of the filling, respectively. Care shall be taken that no two test pieces include the same threads. The average result of the tests shall be recorded separately for warp and filling. No sample for testing shall be taken at less than 8 inches from either selvage for goods 26 inches or more in width, or for goods under 26 inches at less than one-fourth of the entire width of the fabric. If the width of the goods does not admit of cutting pieces as stated above, they shall be taken as near the center as possible.

In the case of a break evidently below the general average for the fabric, a second test on the same threads shall be made and this test shall then be used in obtaining the average result.

In the event of a dispute regarding measurements, the material shall be placed under sufficient tension to make it lie flat upon a table, or other plane surface, and exposed to an atmosphere of 65 per cent relative humidity at 70° F. temperature, and when measured under these conditions the yardage delivered shall be not less than the invoiced yardage.

Causes for Rejection

In the event of a dispute in regard to width, the average width shall be determined by measuring in not less than five places about equally distant, throughout the length of the bolt or roll. In no place shall the variation in width be more than one-eighth inch greater than the tolerance for average width specified in paragraph entitled "Width."

In the event of a dispute in regard to weight, the weight per square yard shall be determined from the nominal width, the invoiced yardage (verified when necessary) and the actual weight of the entire bolt or roll. The results of tests on 1 or 2 yards for width and weight shall not be used alone as a basis for rejection.

No rolls or bolts running less than 10 per cent under the strength specified shall be rejected, provided the delivery in question shall average up to specifications.

No rolls or bolts shall be rejected, the combined strength of the warp and filling of which shall be equal to the combined strength specified in the table below, provided neither element is more than 10 per cent under the requirements applying to that element.

Definition

The terms "bolts" or "rolls" as used above are hereby defined as meaning continuous lengths averaging from 100 to 110 yards, but a roll or bolt of not less than 85 yards will constitute a good commercial delivery.

Table of Construction, Weight and Strength

No. of duck.	Weight. Per linear yard 22 inches wide. Ounces.	Weight. Per square yard. Ounces.	Width. Inches.	Distance of salvage stripe from edge. Inches.	Minimum ply. Warp.	Minimum ply. Filling.	Minimum thread count per linear inch. Warp.	Minimum thread count per linear inch. Filling.	Breaking strength 1 by 1 by 3 inches grab. Warp. Pounds.	Breaking strength 1 by 1 by 3 inches grab. Filling. Pounds.
Hard texture:										
2/0	20	32.72	As specified	2	5	7	26	18	465	435
1/0	19	31.09	....do....	2	5	6	26	18	450	405
1	18	29.45	....do....	1¾	5	5	26	19	440	370
2	17	27.82	....do....	1¾	5	5	27	21	420	345
3	16	26.18	....do....	1½	4	5	29	21	390	330
4	15	24.54	....do....	1½	4	4	29	22	375	300
5	14	22.90	....do....	1½	3	4	34	24	345	285
6	13	21.27	....do....	1¼	3	3	34	26	335	250
7	12	19.63	....do....	1¼	3	3	35	22	300	240
8	11	18.00	....do....	1⅛	3	3	33	23	285	210
9	10	16.36	....do....	1	3	3	38	25	255	195
10	9	14.72	....do....	1	3	3	44	26	245	160
11	8	13.08	....do....	1	3	2	44	32	235	125
12	7	11.45	....do....	1	2	2	48	34	195	120
12	7	11.45	....do....	1	3	2	40	34	195	120
Medium texture:										
2/0	20	32.72	....do....	2	5	8	26	16	450	405
1/0	19	31.09	....do....	2	5	6	26	16	435	380
1	18	29.45	....do....	1¾	5	5	26	17	425	345
2	17	27.82	....do....	1¾	5	5	26	16	410	320
3	16	26.18	....do....	1½	4	5	26	17	370	315
4	15	24.54	....do....	1½	4	4	28	19	350	290
5	14	22.90	....do....	1½	3	4	28	20	315	285
6	13	21.27	....do....	1¼	3	3	34	20	305	250

RUBBER STATISTICS

Import **Production** **Export**

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

January, 1923 to February, 1924.

"Production" and Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.
"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.
"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
MONTH	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
January, 1923	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,383	60,611
February, 1923	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March, 1923	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April, 1923	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609
May, 1923	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June, 1923	55	7,040,600	2,956,943	2,502,185	54	8924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July, 1923	54	6,471,124	1,992,989	2,534,425	53	7,396,444	2,625,118	3,942,247	10	263,891	42,345	45,219
August, 1923	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September, 1923	60	5,397,557	2,029,581	2,623,775	55	6,457,455	3,254,575	3,683,514	10	249,379	37,074	45,971
October, 1923	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November, 1923	55	4,689,329	2,399,725	2,456,296	53	6,693,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December, 1923	51	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408
January, 1924	56	4,808,084	3,220,292	2,785,335	51	6,720,247	3,887,959	3,475,713	10	182,782	53,604	43,375
February, 1924	55	5,265,133	3,278,674	2,771,000	50	7,339,307	4,067,631	3,329,504	10	188,519	60,646	49,370

Portugal, The Azores, and Madeira Islands Import Duties

Imports from Portugal are admitted free of duty into The Azores and Madeira Islands. The Portuguese tariff applies to imports from all other countries.

Maximum rates apply to France, Canada, and other countries not having treaties with Portugal.

Minimum rates apply to United States, Austria, Germany, and other countries having special treaties with Portugal. Certificates of origin are required in order to secure minimum rates.

Conventional rates (plus the surtaxes) apply to the United Kingdom, Italy, Belgium and Spain. Certain elastic corsets and rubber tires and tubes are the only rubber manufactures provided with conventional rates. Countries enjoying the conventional rates pay the minimum rates where conventional rates are not given.

The gold escudo is equivalent to $1.08. On October 15, 1923, the paper escudo was quoted at $0.0401. Import duties for the maximum and minimum rates are paid in gold. Conventional rates are paid in paper, but the surtax (which is applicable only to conventional rates) is paid in gold. Duties are based on legal or net weight, as indicated. Kilo equals 2.2046 pounds avoirdupois.

Tariff No.	Articles	Maximum perkilo.	Minimum perkilo.	Rate&Surtax Escudos perkilo.	Conventional Escudos perkilo.
	Rubber and the like:				
54	Raw (legal weight)	.0.01	0.005	...	...
55	Prepared (legal weight)	.0.02	0.01	...	...
423	Packing, stopping and cords of any vegetable fiber, yarn fabric or trimming, with rubber or asbestos, or impregnated with other substances, with or without a metallic nucleus (net weight)	.0.10	0.07	...	...
	Corsets, stays and belts for women:	(each)	(each)	(each)	(each)
424	Of silk, pure or mixed, with or without rubber	.4.50	3.00	...	...
425	Of net (other than silk), with or without rubber	.1.70	1.10	...	...
426	Of fabrics not elsewhere specified, with rubber	.1.50	1.00	...	...
	Corsets of hosiery fabrics or cotton, linen or hemp, or of cotton, linen or hemp fabrics with rubber or gutta percha	...	...	2.00	0.80
	Fabrics in which rubber is incorporated by any process, whether or not the fabric predominates:	perkilo.	perkilo.	perkilo.	perkilo.
447	Of pure or mixed silk (net weight)	..3.00	2.00	...	...
448	Of wool, pure or mixed (except with silk) (net weight)	..1.00	0.50	...	...
449	Of cotton, linen or the like (net weight)	0.60	0.30	...	...
	Fabrics in bands or strips (tiras):				
450	Of cotton, linen and the like impregnated with rubber or other materials, for electrical insulation (net weight)	.0.15	0.10	...	...
451	Of cotton, linen and the like with rubber superimposed, up to 10 cm. wide (net weight)	.0.015	0.01	...	...
549	Transmission belting of any material (legal weight)	.0.045	0.03	...	...
595	Solid rubber tires with or without iron rim, for motor trucks and similar vehicles (legal wt.)	.0.10	0.05	...	...
608	Inner tubes and outer covers of rubber, with or without textile fabric, for vehicle wheels, and strips of rubber glued on cloth for repairing (legal weight)	.0.40	0.20	0.05	0.18
	Rubber and the like:				
640	Thread (legal weight)	0.08	0.04	...	...
641	Tubes, even strengthened with threads or wire of any kind, fabrics or trimmings (legal weight)	.0.06	0.03	...	...
642	Manufactures, not elsewhere specified (legal weight)	.0.80	0.40	...	...
769	Buttons, not elsewhere specified (legal weight)	.1.00	0.50	...	...
770	Toys and games, except billiard tables and accessories therefor (legal weight)	..0.80	0.40	...	...
	Footwear (boots and shoes):	perpair.	perpair.	perpair.	perpair.
775	Not elsewhere specified	.0.50	0.25	...	...
		perkilo.	perkilo.	perkilo.	perkilo.
777	Mats and matting of any substance (legal weight)	.0.16	0.08	...	...

Report of Rims Inspected and Approved during March, 1924

SIZE	NUMBER	PCT.
26 x 3 MC	7,305	0.3
28 x 3 MC	6,400	0.2
30 x 3 cl	73,821	2.8
28 x 3½ ss	128,153	4.9
30 x 3½ cl	1,067,574	41.8
30 x 3½ ss	460,792	17.6
32 x 3½	6,980	0.3
28 x 4 ss	65,502	2.5
29 x 4 ss	113,810	4.3
30 x 4 ss	32	0.0
31 x 4 cl	167,077	6.4
31 x 4 ss	575	0.0
32 x 4	201,334	7.9
33 x 4	38,685	1.5
34 x 4	500	0.0
29 x 4½	45,219	1.8
30 x 4½	8,322	0.3
31 x 4½	50	0.0
32 x 4½	160,658	6.3
34 x 4½	36,993	1.4
30 x 5	10,459	0.4
34 x 5	14,615	0.6
32 x 6	1,853	0.1
36 x 6	2,870	0.1
34 x 7	187	0.0
40 x 8	187	0.0
	2,620,953	100.0

TECHNICAL ABSTRACTS

Mechanical **Chemical** **Physical**

Manufacture of Artificial Silk from Rubber

Yarns or threads consisting essentially of rubber are produced by extruding through fine jets rubber solutions, rubber latex, or masticated rubber with simultaneous or subsequent vulcanization by any of the known methods. The rubber may be mixed with gutta-percha, balata, "rubber substitute," or coloring matters. The jets of latex or solution can be solidified in warm air or in a bath of suitable precipitant, the rubber then passing through a bath of soap and water or of shellac in alcohol to correct adhesiveness. (British Patent No. 205,532.)

Vulcanization of Rubber

British Patent No. 204,757 is concerned with an improvement in the process of vulcanizing rubber in which there is no danger of over-vulcanization. The vulcanization process is carried out in the presence of a zinc or cadmium alkylxanthate, particularly the propylxanthates, together with zinc oxide, at a temperature of 60 to 130 degrees C. Under these conditions there is no danger of over-vulcanization. The vulcanization process proceeds very rapidly to a definite limit and then ceases even in the presence of a considerable excess of residual sulphur. It is thus possible to obtain a product of definite physical properties even with large variations in the period of heating without fear of deteoriation by overheating.

Acceleration of Vulcanization

In British Patent No. 197,632 there is described a process of accelerating the vulcanization of rubber by using the products that are obtained by the condensation of ammonia and aldehyde. The rubber is vulcanized with sulphur, together with zinc oxide, of desired, using a condensation product of ammonia with a stright chain aldehyde as an accelerating agent. Heptaldehyde-ammonia may be taken as an example of this class of substances. It possesses a distinct advantage over acetaldehyde-ammonia, as is claimed in the patent, in that it is more active, more stable and capable of being stored for a long time without deterioration; moreover it is an oil, substantially non-toxic, and without any discoloring effect on rubber.

Colloid Chemistry of Vulcanization

The effect of sulphur and of sulphur chloride in the vulcanization of rubber is possibly dependent on the formation of "elastic rubber" so that the product exhibits superposed the elastic characters of rubber and sulphur. There is a noteworthy analogy between the effect of cosl and of vulcanization with sulphur. With progressive vulcanization on the one hand or more intense cooling, on the other hand, the raw rubber undergoes a gradual change in tensile strength which attains a maximum and then decreases, and a gradual reduction in extensibility. Such "vulcanization" by cooling is of course reversible. Rubber solutions also show an analogous reversible gelatinization, even a two per cent solution of rubber in carbon disulphide gelatinizing at a temperature of 72 degrees C. (*Kolloid Zeit.* volume 33, pages 267-71.)

Predetermining Properties of Rubber

A very interesting article has appeared in the German journal, *Kolloid Zeitung,* volume 33, pages 348 to 353 on a method for the predetermination of the properties of vulcanized rubber. The process of the vulcanization of a two per cent solution of rubber in benzene at a temperature varying between 16 and 17 degrees C after the addition of 3.5 cubic centimeters of sulphur chloride to one hundred cubic centimeters of the solution, can be conveniently measured by recording the load that is necessary to depress by one centimeter a glass rod of three millimeters diameter immersed vertically in the jelly to a depth of 4.5 centimeters. The curves for different rubbers showing the relation between the period and the necessary load occupy different positions and never intersect.

The relative position of these curves agrees within the experimental error with the relative values of the optimum tensile strength obtainable on direct vulcanization of the dry rubbers by immersion in a three per cent solution of sulphur chloride in benzene. On the other hand if the depression of the rod into the jelly is compared with the corresponding load without reference to the time, the order in which the rubbers are placed by this characteristic agrees with that of the respective periods necessary for the occurence of gelation.

This connection probably constitutes a correction factor to the relation between solution-viscosity of various rubbers and their elastic properties after vulcanization. Experiments on the load (applied gradually) necessary to cause a vertical rod to sink 1.5 centimeters from the surface downwards into similar jellies to those above gas curves which, with prolongation of the time, tended to approach a maximum; with one exception the values of these maxima for fourteen rubbers fell in the same order as the optimum strength of the cold-vulcanized rubbers. It is possible, therefore, to deduce the relative strength of dry rubber after cold vulcanization from an examination of the jellies produced by the action of sulphur chloride on their solutions in benzene.

Imitation Gutta Percha and Leather

Imitation gutta percha and leather are produced by passing raw paper through a bath of sizing material, which for example can consist of glues, casein, or albumen. The sizing material is used in the form of a 15 per cent solution and at a temperature which varies between 35 and 40 degrees C. The paper which has been impregnated in this manner can be pressed between rolls either during or immediately after immersion. After several hours have elapsed, hardening materials such as alum, chromium salts, formaldehyde, and the like are applied. The material is then softened by treatment with glycerin or alternatively, soap or castor oil may be included in the sizing bath. The sheets are finally coated with a transparent varnish. The addition of sodium hydroxide up to two per cent, or of latic acid up to thirty per cent on the weight of the dry sizing material, facilitates the impregnation of the paper in the sizing solution. For combining several layers of treated paper a stronger solution, for example of twenty-five to thirty-five per cent concentration, of the sizing material is employed. (British Patent No. 207,352.)

Rubber Analysis Methods

At a joint meeting of the American Chemical Society held in Pittsburgh, Pa. in 1922, the Committee of Analysis of the Division of Rubber Chemistry and a sub-committee of the American Society for Testing Materials, adopted standard methods for the analysis of rubber goods. These methods have now been approved by the A.C.S. Supervisory Committee on Standard Methods of Analysis. A sub-committee of the A.S.T.M., has also recommended that these methods now be adopted by that society.

The methods proposed are indirect ones because up to the present time no simple method has been devised for the direct

determination of the quantity of rubber present in a vulcanized compound. It is said by the A.C.S. sub-committee that the proposed methods will give satisfactory results in all cases known at the present time, excepting when there are decomposable fillers, such as cellulose, carbonates or a high-percentage of mineral rubber, present in the compound to be analysed. But methods for the analysis of compounds containing carbonates, talc, and asbestine are also given. No accurate method is known for the analysis of compounds containing a high percentage of mineral rubber. (*Industrial & Engineering Chemistry*, April, 1924.).

The Plasticity of Rubber

An apparatus for the measurement of the plasticity of crude rubber has been devised that consists of two parallel plates between which the sample is placed. The test is carried on with a small amount of material under known temperature conditions to insure a true plastic flow. One of the plates is free to be raised and lowered above the other in such a way that it is always exactly parallel to it. A gauge registers the thickness of the disc of rubber.

The test proceeds as follows: After the press has been heated to the desired temperature (around 100 degrees C. for crude rubber), in an oven a 15 or 16 mm. disc of a required weight is cut from a round pellet or short cylinder, placed between paper, and laid in the press. Gauge readings are taken at known time intervals, usually 3, 5, 10, etc. minutes, in order that a thickness-time curve may be plotted. The thickness of the paper subtracted from the gauge reading gives the thickness of the rubber.

Plasticity determinations may be made with compounded stocks as well as with pure rubber, excepting those samples that begin to cure in a few minutes at the temperature of the determination. (The Plasticity of Rubber and Its Measurements; by Ira Williams, Firestone Tire & Rubber Co., Akron, Ohio; *Industrial and Engineering Chemistry*, Vol. 16, No. 4.)

Synthetic Resin—Rubber Compositions

Resins, which are made artificially, and rubber may be advantageously compounded to give mixtures from which different sorts of rubber merchandise may be manufactured. The resins that are used for this purpose are obtained by the condensation of phenol with formaldehyde, etc. They are soluble in alcohol and acetone. These solvents do not dissolve rubber, which however is soluble in chloroform, benzene and other solvents which have no dissolving action at all on the artificial resins.

It is possible to mix together the rubber and synthetic resins by dissolving each substance separately and then mixing the solution together in the colloid mill. It is also possible to employ dichlorhydrin and cyclohexanol which possess the property of dissolving the artificial resins and of causing the rubber to swell. Then the mixture may be made in the usual manner either in the colloid mill or in the ordinary rubber mixer. It is possible to add any sort of filler and sulphur with this mass so that the rubber may be vulcanized without any difficulty. (French Patent No. 557,765.)

Vulcanization of Rubber

The importance of using a formula for the velocity constant of vulcanization, $K = \frac{1}{t} \cdot \log S \text{ total}/S \text{ combined}$ which was deduced by the author for the study of the vulcanization processes is emphasized. By means of various experiments it is shown that the water vapor has an accelerating effect on the hot vulcanization process, that rubber which has been rolled after mixing with sulphur and then heated gives a more highly vulcanized but less elastic product than a similar sample which has received no mechanical treatment and that the relative quantities of insoluble sulphur present in vulcanized rubber, and the velocity constant k, diminish as the absolute quantity of sulphur increases. Vulcanized rubber has the same heat of combustion as unvulcanized rubber containing the same percentage of sulphur, namely 25 per cent. This heat of combustion is 8611.4 and 8609.5 calories respectively and from this it appears that the heat of reaction of vulcanization is extremely small.

An exothermic reaction was, however, observed to occur when mixtures containing over thirty per cent of sulphur, were heated above a temperature of 155 degrees C, accompanied by the evolution of some hydrogen sulphide, the product of reaction being vulcanite. The specific gravity of the products of vulcanization increases regularly with the degree of vulcanization. Thus in the hot vulcanization process the rubber first absorbs the melted sulphur, which does not entirely crystallize on cooling, but remains partly in a super-cooled condition, in which it is insoluble in acetone. Part of the sulphur, however, also combines with the rubber to form a chemical compound.

Three types of sulphur are therefore present, crystallins sulphur soluble in acetone, amorphous sulphur(supercooled) insoluble in acetone but oxidizable by bromine water and chemically combined sulphur unaffected by bromine or by acetone. A sample of vulcanite containing 55.35 per cent of insoluble sulphur was oxidized with bromine water, and the sulphur content was found to be 46.36 pe rcent of oxidizable sulphur and 8.99 per cent of chemically combined sulphur. (*J. Russ. Phys. Chem. Soc.* volume 53, pages 79-109.)

Aging Properties of Sprayed Rubber

Preliminary "accelerated" tests which were made with a fine grade of Para rubber, smoked sheet rubber and rubber prepared by the dessication of sprayed latex, indicated that, when vulcanized to an approximately comparable physical condition, there is quite a difference between the aging qualities of the different kinds of rubber. It was found that the aging qualities of the sprayed rubber are superior to those of the other two types, the Para rubber being the worst of the three. *Bulletin of the Rubber Growers' Association*, volume 5, pages 697 to 700.

MANUFACTURE OF HARD RUBBER

(Continued from Page 58)

a capacity of from 25 to 600 liters per minute have been made from ebonite.

Various other auxiliary apparatus such as ladles, scoops, jars, pails, buckets, measuring flasks and vessels, etc. are also made of hard rubber when these utensils are to be used with corrosive liquids. Ebonite is also employed in coating various pieces of apparatus made from iron, such as iron tanks, agitators, piping, aspirators, etc.

Coating Iron with Ebonite

According to a recent invention an important improvement has been made in the art of coating metallic objects with hard rubber. This is done by first applying to the surface of the iron a special composition of soft rubber and then the ebonite and vulcanizing the entire article. The soft rubber adheres more strongly to the rubber and acts as a binder for the hard rubber layer which covers it. It also protects the hard rubber coating from the action of the hot contents of the apparatus and takes up the expansion that occurs so that the ebonite layer is not cracked.

A few definite examples may be given to show how hard rubber is used in the chemical industries. For example in the manufacture of hydrochloric acid, it is employed in the construction of tanks, pipe lines, pumps, siphons, etc. It may be used in making siphons employed in the manufacture of nitric acid. Ebonite apparatus is also employed in the artificial silk industry, in the electrolytic industries, manufacture of chlorine and bleaching powder, galvano-plastic and plating work, in working up vinegar, fruit juices, cider and for many other purposes. Its resistance to corrosion, hardness, non-absorptive surface, absolutely dense internal structure make it a very useful substance for a great variety of purposes.

The writer is indebted for part of his information to articles on hard rubber in the German journal, *Der Gummi Zeitung*.

MARKETS

Cottons and Fabrics

NEW YORK, April 15, 1924

During the last two weeks so many interesting events have transpired in the market it will be worth while to trace their effects on raw cotton. The majority of traders believe that an upward movement, which, although it may not rise to the former high level of the winter, will materially effect the value of the remnant of the crop still unmarketed in the South. For the week ending April 5 a drop in the price of May contracts was recorded, then the same month recovered 438 points and traded as high as 30.98.

On the 8th a reaction of the previous day was followed by a rebound that established old crop positions at new high levels. The principal feature of the advance was the bullish spot news that supplies of old crop shorts available for delivery on contract would not be sufficient to protect the remaining interest. Southern spot markets were 100 to 175 points higher, with middling quotations ranging from 30.75 to 32.10. On the 11th, May led the market recovery because of a renewal of covering by near-month shorts. May contracts rose to 31.95. Before the close of that day a reactionary tendency was felt. On the following day May broke and was quoted as low as 30.40. July also followed suit and was quoted from 28.90 @ 29.85. The fall was partly precipitated by false reports of shortening of time in Manchester, and were later vigorously denied.

A less severe break was recorded on the 14th due to a sudden withdrawal of the demand for old crop months. Depression seemed to be in the air. The cotton market acted tired not only in New York, but in Liverpool and New Orleans. Traders insisted that the recent big advances had discounted bullish reports for the time. The stock market also made a particularly bad impression. Cotton speculation slowed down after the previous hectic activity and yielded to the conservatives.

Predictions are made that the cotton-growing industry of Australia will soon exceed that of the wool in value due to the rapidity of the strides that have been made in the past few years. It will only be a question of time, said these reports, before the cotton crop will exceed $350,000,000, the approximate annual value of the wool crop. It is claimed that the country has an admirable climate for the production of cotton and the rainfall and humidity are also satisfactory. Modern methods of irrigation are being introduced in the cotton belt which is estimated at 35,000,000 acres. In 1922 Queensland secured 642 pounds of cotton-seed to the acre in comparison with an average of 492 pounds obtained in the United States.

According to an announcement made April 14 by the Census Bureau at Washington cotton consumed during March amounted to 483,928 bales of lint and 41,030 of linters, compared with 507,876 of lint and 41,698 of linters in February this year, and 624,264 of lint and 54,509 of linters in March last year.

Cotton on hand March 31 was as follows:

In consuming establishments, 1,498,266 bales of lint and 126,149 of linters, compared with 1,578,272 of lint and 123,099 of linters on February 29 this year, and 2,033,837 of lint and 172,600 of linters on March 31, last year.

In public storage and at compresses 1,983,544 bales of lint and 89,032 of linters, compared with $2,485,009 of lint and 87,087 of linters on February 29, this year, and 2,379,697 of lint and 49,258 of linters on March 31, this year.

Imports during March totaled 49,832 bales, compared with 48,601 in February, this year, and 53,219 in March, last year.

Exports during March totaled 332,146 bales, including 17,091 of linters compared with 482,216 including 12,275 of linters during February, this year, and 318,210, including 8,347 of linters in March, last year.

Cotton spindles active during March totaled 32,392,171, compared with 32,-68,786 in February, this year, and 35,-498,234 in March, last year.

Quotations as of April 14 follow:

	Open.	High.	Low.	Close.	Close. March 31
May	30.87	30.88	30.00	30.00@30.05	28.43
July	29.30	29.40	28.65	28.68@28.71	27.35
Oct.	25.28	25.39	25.03	25.03@25.07	24.50
Dec.	24.67	24.75	24.48	24.48	24.20
Jan.	24.34	24.35	24.20	24.20	23.86

EXTRA STAPLE COTTON

Since our last report all grades in this market have shown an advance. Prices on extra staple cotton, strict middling in grade and color, f.o.b., New Bedford, were quoted today as follows:

1 1-8 inch, 33½ @ 34½ cents.
1 3-16 inch, 34½ @ 35 cents.
1 1-4 inch, 35½ @ 36½ cents.
1 5-16 inch, 36½ cents upward.

(Continued on Page 66)

OIL PROCESS TO FIGHT BOLL WEEVIL

The Texas Company recently announced a new process for combatting the boll weevil. Although details are lacking as we go to press, it is understood to be a petroleum mixture that is not only offensive but deadly to the pest. It may not be ready for extensive use this season but there is said to be no doubt as to its worth. The corporation plans to permit its use without large profit and as a measure of American and world benefit. If the process results as advantageously as already predicted, it will be of incalculable benefit, as cotton maintains the balance of the trade of the United States and is one of the most important commodities entering into every-day use by man.

RANGE OF SPOT COTTON PRICES AT NEW YORK 1911 TO 1924

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Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, April 15, 1924—There has been no material change in the market for industrial chemicals during the past fortnight. Good volume of business is reported by some factors but this condition is not expected to last throughout the spring. Prices of most of the industrial chemicals are firm. Business on old contracts is reported coming through on a very satisfactory basis. At the present time, considering the restricted demand in many quarters, prices hold little interest for buyers notwithstanding the fact that many quotations are considered low. Buyers are not inclined to commit themselves on contracts for too distant deliveries; this conservative policy is manifested by many large rubber manufacturers. Accelerators show a firmer tone but as yet quotations have not been greatly affected.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .90	@	.95
Aniline oil, drums	lb.	.16	@	.18
Diphenylguanidine	lb.	1.05	@	1.20
Excellerex,	lb.	.40	@	.45
Formaldehyde-Aniline	lb.	.47½	@	—
Hexamethylene-tetramine	lb.	.82	@	.85
Paraphenylenediamine	lb.	1.40	@	1.50
Super-Sulphur No. 1	lb.	.50	@	.60
Super-Sulphur No. 2	lb.	.25	@	.35
Tetramethyl—Thiuramdisulphide	lb.	6.00	@	—
Thiocarbanilide, kegs	lb.	.26½	@	—
Vulcocene	lb.	.35	@	—

Inorganic

Lead, sublimed blue	lb.	.09¼	@	—
Lead, white	lb.	.09	@	.09½
Litharge, domestic	lb.	.11½	@	—
Lime, Superfine	lb.	.01½	@	.03½
Magnesia, calcined, light,	lb.	.23	@	.24
extra light	lb.	.45	@	.60
heavy	lb.	.05½	@	.06½

COLORS

Blacks

Arrow "Aerfloted"	lb.	.09	@	.10
Bone Black	lb.	.05½	@	.07½
Carbon "	lb.	.09	@	.12
Drop "	lb.	.07½	@	.10
Ivory "	lb.	.15	@	.45
Lamp "	lb.	.12	@	.40
Micronex	lb.	.09	@	.14

Blues

Cobalt	lb.	.21	@	.23½
Prussian	lb.	.40	@	.43
Ultramarine	lb.	.12	@	.35

Browns

Iron oxide	lb.	.03½	@	.06½
Sienna, Italian,	lb.	.06	@	.14½
Umber, Turkey,	lb.	.04	@	—
Vandyke, domestic	lb.	.03½	@	.04

Greens

Chrome, light	lb.	.28	@	.31
medium	lb.	.30	@	.35
dark	lb.	.32	@	.42
Commercial	lb.	.12	@	—

Reds

Antimony crimson, 15/17 F.S.	lb.	.39	@	.55
sulphur free	lb.	.45	@	.60
golden, 15/17 F.S.	lb.	.19	@	.24
calcium and sulphur free	lb.	.40	@	—
red sulph.15-17 F.S.	lb.	.15	@	.16
Indian, English	lb.	.11	@	.13
Para toner	lb.	1.00	@	1.10
commercial	lb.	.16	@	.18
Red Oxide, reduced	lb.	.08	@	.12
pure	lb.	.12	@	.14
Toluidine toner	lb.	2.00	@	2.10
Venetian red	lb.	.02	@	.05½
Vermillion, quicksilver, English	lb.	1.22	@	1.25
domestic	lb.	.15	@	.25

Whites

Albalith	lb.	.07	@	.07¼
Aluminum bronze	lb.	.55	@	.60
Lithopone Azolith	lb.	.06¼	@	.06¾
Zinc Oxide—American Process XX red	lb.	.07⅞	@	.08⅛
Kadox, black label, bags, cars		.09¾	@	—
blue " " "		.09½	@	—
red " " "		.09¼	@	—
American Azo: ZZZ (lead free)	lb.	.07¾	@	.08¼
ZZ (under 5 per cent leaded)	lb.	.07	@	.07½
Z (8-10 per cent leaded)	lb.	.06¾	@	.07¼
Zinc Oxide—French Process White seal	lb.	.12	@	.12¼
Green seal	lb.	.10¾	@	.11¼
Red seal	lb.	.09¾	@	.10¼

Yellows

Chrome, light		.18½	@	.19
dark and medium	lb.	.18½	@	.19
Cadmium Sulphide	lb.	1.75	@	2.50
Ocher, French	lb.	.01¾	@	.03
domestic	lb.	.02¼	@	.03

COMPOUNDING INGREDIENTS

Aluminum Flake	ton	25.00	@	40.00
hydrate light	lb.	.17	@	.18
Ammonia carbonate,	lb.	.09¼	@	.10½
Asbestine	ton	13.50	@	17.00
Barium carbonate,	ton	80.00	@	90.00
Barium Dust	lb.	.05	@	.06
Barytes southern off-color,	ton	15.00	@	18.00
Western prime white	ton	22.00	@	23.00
Imported	ton	30.00	@	35.00
Basofor	lb.	.04¼	@	—
Blanc fixe, dry f.o.b. works	lb.	.04	@	.04½
Carrara filler	lb.	.01½	@	.02
Chalk, precipitated, extra light	lb.	.04¼	@	.05
heavy	lb.	.03¼	@	.04
Clay, China, domestic,	ton	12.00	@	15.00
Dixie	ton	22.00	@	32.00
Blue Ridge	ton	12.00	@	25.00
Fossil flour	lb.	.03	@	.05
Glues, extra white	lb.	.22	@	.30
medium white	lb.	.20	@	.26
cabinet	lb.	.18	@	.28
cabinet low grade	lb.	.15	@	.18
common bone	lb.	.11	@	.15
Graphite flake, bbls.	lb.	.06½	@	.12
amorphous	lb.	.04	@	.10
Infusorial earth, powdered	ton	60.00	@	—
bolted	ton	70.00	@	—
Liquid latex	gal.	1.25	@	1.35
Magnesia, carbonate	lb.	.08¼	@	.08¾
Mica, powdered	lb.	.07	@	.15
Rotten Stone (powdered)	lb.	.02½	@	.04½
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.27	@	3.54
Talc, domestic	ton	15.00	@	22.00
French	ton	20.00	@	25.00
French, high grade	ton	40.00	@	45.00
Italian	ton	50.00	@	55.00
Terra Alba	cwt.	1.75	@	1.90
Tripoli, white	lb.	.02	@	.02¼
Whiting, commercial	cwt.	.85	@	1.15
domestic	cwt.	13.00	@	15.00
gilder's bolted	cwt.	1.10	@	1.20
English cliffstone	cwt.	1.50	@	—
Paris whiteAmerican	cwt.	1.25	@	1.50
Quaker	ton	13.00	@	15.00
Sussex	ton	8.00	@	16.00
Wood pulp XXX	ton	35.00	@	—
" " X	ton	25.00	@	—

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Granulated M.R.	ton	50.00	@	54.00
Hard hydrocarbon	ton	30.00	@	40.00
Soft hydrocarbon	ton	30.00	@	40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00	@	50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00	@	45.00
Synpro, granulated, M. R. (factory)	ton	55.00	@	70.00

SOFTENERS

Acids

Acetic, 28 per cent	cwt.	3.38	@	3.63
Cresylic, 97%	gal.	.67	@	.77
95%		.65	@	.70
Muriatic, 20%	cwt.	.90	@	1.00
Nitric, 36 degrees	cwt.	4.25	@	4.50
Sulphuric, 60 degrees	ton	10.00	@	12.00
66 degrees	ton	14.00	@	16.00
Tartaric, crystals	lb.	.30	@	—

Alkalies

Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58%	cwt.	2.04	@	2.19

Oils

Castor, No. 3, bbls.	lb.	.15	@	—
Chinawood, bbls.	lb.	.15	@	—
Corn, crude, bbls.	lb.	.11	@	—
refined	lb.	.12	@	—
Cottonseed, crude		8.75	@	9.00
Glycerine,	lb.	.16½	@	.17
Linseed, domestic	gal.	.84	@	.98
Palm, Niger	lb.	.07	@	—
Lagos	lb.	.07½	@	.08
Peanut,domestic,crude	lb.	.13	@	—
Petroleum, amber	lb.	.04¾	@	—
dark, amber	lb.	.04½	@	—
Pine, steam distilled	lb.	.65	@	.70
Rapeseed, refined	gal.	.90	@	.92
blown	gal.	1.05	@	—
Rosin, first rectified	gal.	.42	@	.43
second refined	gal.	.46	@	.48
Soya Bean		.11¾	@	—
Tar, commercial	gal.	.50	@	—

Resins and Pitches

Cumar resin, hard	lb.	.09	@	.10
soft	lb.	.09	@	.10
Parra M.R.	lb.	.06	@	.07
Tar Retort	bbl.	11.00	@	—
kiln burned	bbl.	11.00	@	—
Pitch, Burgundy	lb.	.05	@	.06
coal tar	gal.	.06	@	.08
pine	bbl.	6.50	@	—
Rosin, grade K	bbl.	5.70	@	5.75
Shellac, fine orange	lb.	.61	@	.62

Solvents

Acetone, drums	lb.	.17	@	18
Alcohol, denatured, No. 1 bbls.	gal.	.52½	@	.56½
Benzol, 90%	gal.	.23	@	.30
pure		.24	@	.31
Carbon bisulphide	lb.	.06	@	.07
tetrachloride	lb.	.08½	@	.09½
Dimethylaniline	lb.	.39	@	.41
Motor gasoline, steel bbls.	gal.	.20	@	—
Naptha, V. M. & P.	gal.	.18	@	—
Toluene	gal.	.26	@	.31
Turpentine, spirits	gal.	1.01	@	—
wood	gal.	.90	@	—

Waxes

Bayberry	lb.	.20	@	.22
Beeswax	lb.	.40	@	.42
Carnauba, No. 1	lb.	.38	@	.39
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.05½	@	.06
Ozokerite, black	lb.	.23	@	.24
green	lb.	.27	@	.28
Paraffine	lb.	.04¼	@	.05½
Phenol	lb.	25	@	.26
Sweet wax	lb.	.10	@	.12

SUBSTITUTES

Black	lb.	.09	@	.14
White	lb.	.10	@	.16
Brown	lb.	.10	@	.15
Brown factice	lb.	.09½	@	.15
White factice	lb.	.08½	@	.15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.17	@	.20
Sulphur Chloride (drums)	lb.	.06	@	.08
Sulphur flour Commercial bags,	cwt.	1.35	@	—
" bbls.	cwt.	1.70	@	—
Superfine, bags,	cwt.	2.00	@	—
" bbls.	cwt.	2.40	@	—
100% pure, refined, bags	cwt.	2.35	@	—
bbls.	cwt.	2.60	@	—

Crude Rubber

NEW YORK, April 15, 1924

During the past two weeks there have been many inquiries for crude rubber, a few of which developed into orders. A conservative policy is still apparent on the part of manufacturers, who are buying for immediate needs only.

London has heard the rumor that a strong and effective combination among buyers already exists, and legislation has been suggested here for the formation under our laws of a co-operative purchasing agency for handling such raw commodities that are not produced here. As this may easily prove a menace to the foreign markets, an insistent demand is in evidence for a co-operative selling combine by the plantation companies. Developments in this direction are being followed with interest. The trade does not expect any further news on curtailment until the Stevenson committee meets at the end of this month to set a new exportable allowance figure.

The week ending April 4, that started off with confident expectations on bullish news ended with a less optimistic outlook due to reports that production had run ahead of demand. A slight advance of ¼ to ¾ of a cent per pound was recorded on the 7th when the trade turned its attention from the problematical production situation to conditions abroad. But on the next day prices fell back to their old levels. Forward positions resisted, and at the close July-September for ribbed smoked sheets was not obtainable below 23⅛. For the next two days the tone was easy in sympathy with the London market.

On the 11th the trade manifested great interest in a statement issued by the Netherlands Chamber of Commerce in New York that outlined the reasons for the failure of the Dutch rubber planters to co-operate on restriction. It was pointed out that although it is possible to secure the co-operation of the white planters working with either national or international capital, the problem of dealing with the scattered native producers is exceedingly difficult. The aggregate of native production constitutes a factor in the statistical position and restrictionists express the fear that native production may destroy the effect of the Dutch East Indies restriction policy.

It is pointed out that over 30 per cent of the 137,000 tons of rubber produced in Dutch possessions in 1923 was not only grown by natives but sold as much as 10 cents a pound under the prevailing market price. The natives operate independently of both the Dutch and British and probably would increase their activities and depress the market as effectively as they have been doing in the past were both governments to combine on restriction. For 1924 the production of European planters in the Dutch East Indies is estimated at 100,000 tons as compared with a production by the natives of 90,000 tons.

Shipments from Malaya for March to all parts total 22,293 tons, including reexports. Imports for the first three months of this year will probably amount to 67,000 tons, which, added to stocks of approximately 76,560 tons would make a total supply of 144,160 tons. It is pointed out in a survey made of the first three months of the year that if consumption should equal 96,000 tons the total for the same period last year, there would remain in the hands of dealers and manufacturers about 50,000 tons of crude rubber, as of March 31. However, the total is more likely to be 60,000 tons.

The fact that this country took 16,245 tons less crude rubber for the first three months of this year than it did in the same period last year served to keep prices firm. Spot and April deliveries were quoted slightly higher. Today London prices were slightly easier and Singapore also eased up a bit. Quotations of this date are practically as follows:

NEW YORK MARKET

Plantations—			
Ribbed Smoked Sheets:			
Spot	.22⅝	@	—
May	.22½	@	—
June	.22⅝	@	—
July-September	.23¼	@	—
First Latex, crepe, spot	.22⅝	@	—
Amber Crepe No. 1, spot	.22¼	@	—
" " No. 2,	.22	@	—
" " No. 3,	.21¾	@	—
" " No. 4,	.21⅝	@	—
Brown Crepe, Rolled	.22	@	—
" " Clean, thin	.21⅞	@	—
" " Specky	.21⅝	@	—
Scrap, Colombo No. 1	.18	@	—
Pontianac—			
Prime Pressed	.13	@	—
Palembang	.13½	@	—
Bangermassin	.09	@	—
Sarawak	.07¾	@	—
Paras—			
Up-river Fine	.21	@	—
" Medium	.18½	@	—
" Coarse	.17½	@	—
Islands, fine	.16¾	@	—
" medium	.14½	@	—
" coarse	.11½	@	—
Cameta	.11½	@	—
Madeira Fine	.22	@	—
Acre Bolivian, fine	.21¼	@	—
Cut Beni Bolivian, fine	.22	@	—
Tapajos, fine	.19½	@	—
Xingu Ball	.18¼	@	—
Caucho Ball—			
Upper, shipment	.17¼	@	—
Centrals—			
Central, scrap, prime	.16	@	—
Corinto, scrap	.16	@	—
Esmeralda, sausage	.16¼	@	—
Guayule, w and d.	.24	@	—
Africans—			
Benezuela, No. 1	.14	@	—
" No. 2	.12¾	@	—
Congo, upper, black	.21½	@	—
" " red	.21	@	—
Kassai, Prime Red	.19¾	@	—
Balata—			
Black, Columbia	.54	@	.56
" Cuidad	.65	@	—
Surinam, sheet	.73	@	.74
Gutta Percha—			
Sink	.16½	@	.17
Red Macassar	2.80	@	3.00
Chicle—			
Mexican, Yucatan	.65	@	.67

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	12⅝d
May-June	12⅝
June	12½
July	12⅝
July-Sept.	12¾
Oct-Dec.	13⅛

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	11¾d
April	11¾
May-June	12
July-Sept.	12⅛

Chemicals

Carbon Black—Since our last report this ingredient has become firmer in price in view of the strength displayed at Louisiana. Demand is routine. No effort being made to force sales.

Mineral Rubber—Ample supplies on hand but prices show practically little change for present requirement shipments.

Sulphur—Little activity is reported with the exception of a routine demand. Prices are firm.

Diphenylguanidine—Prices practically unchanged as to seller and quantity. Like most of the other accelerators it is in routine demand only.

Lithopone—Spot prices firm. Producers are reported to be working at capacity. According to some factors, prospects are for an unusual consumption for 1924.

Asbestine—Demand continues to hold. Prices steady at prevailing quotations.

Reclaimed Rubber

NEW YORK, April 15, 1924

There has been no radial change in the markets for reclaims since our last report. Reclaimers, however, are still optimistic; one of the largest reported that the volume of orders placed is fairly satisfactory for this time of the year when there are always rumors of the curtailment of production in certain branches of the industry. A number of grades were easier in tone, namely friction, unwashed boots and shoes, truck tires, washed black auto tires, white tires, and dark gray tires. Quotations follow:

Floating Tube	.13½	@	.14
Friction	.21	@	.22
Boots and Shoes (unwashed)	.09½	@	.09¾
Boots and Shoes (washed)	.12½	@	.13
Mechanical	.09	@	.09½
Hose	.09½	@	.10
Tires, truck	.08	@	.08¼
Tires, auto, black	.08¾	@	.09
Black (washed)	.10½	@	.10¾
White	.15	@	.15¼
Dark Gray	.09¾	@	.10
Light Gray	.11	@	.11¼

Scrap Rubber

NEW YORK, April 15, 1924

The market for scrap rubber has been very quiet during the past two weeks. Few orders are reported by dealers, most of whom are pessimistic regarding the future tendency of the market. As is usual at this time of the year, scrap rubber is plentiful. No worth while activity is expected for several months. Prices are nominally as follows:

Auto tire peelings	.00⅝	@	.00¾
Standard White auto ....ton	14.00	@	15.00
Mixed auto .....ton	10.00	@	11.00
Bicycle tires .....ton	7.00	@	8.00
Clean solid truck tires	.00⅝	@	.00¾
Boots and shoes	.02	@	.02⅛
Arctics, untrimmed	.01	@	.01⅛
Arctics, trimmed	.01⅜	@	.01½
Inner tubes, No. 1	.03½	@	.03⅝
Inner tubes, compounded	.02	@	.02⅛
Inner tubes, red	.01⅞	@	.02
Battery jars, clean hard rubber	.01	@	.01⅛
Air Brake Hose .....ton	10.00	@	11.00
Rubber Hose .....ton	7.00	@	8.00
Red packing	.01	@	—

Rubber Patents

APRIL 1, 1924

1,488,474. Machine for Molding Insulators. James A. Burns, Pittsburgh, Pa., assignor to Westinghouse Electric & Manufacturing Co.

1,488,504. Method of Making Insulating Material. John J. Keyes, Wilkinsburg, Pa., assignor to Westinghouse Electric & Manufacturing Co.

1,488,536. Protective Garment. Walter L. Fry, New Rochelle, N. Y.

1,488,544. Non-skid Attachment for Vehicle Wheels. George Francis Hogan, Chicago, Ill.

1,488,739. Cushion Heel. William P. Cosper, Milwaukee, Wisconsin, assignor to Nu-Matik Rubber Heel Company, Chicago, Illinois.

1,488,743. Thermal Treatment Bag. Anton C. Eggers, Brooklyn, N. Y., assignor to The Goodyear's India Rubber Glove Mfg. Co.

1,488,749. Leveling Device. Jacob Franz, Erie, Pa.

1,488,777. Syringe. Ralph L. Clements, Philadelphia, Pa., assignor to The S. S. White Dental Manufacturing Co.

1,488,804. Rug. Charles C. Brown, Knoxville, Pa.

1,488,813. Relief Valve for Pneumatic Tires. William C. Hagen and Ralph A. Haas, Marion, Ohio.

1,488,845. Method & Apparatus For the Manufacture of Wheels. Joseph G. Swain, Akron, Ohio, assignor to The Firestone Steel Products Co., Akron, Ohio.

1,488,906. Spring Insert for Dust Caps. Junius A. Bowden, Los Angeles, Cal, assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,488,924. Dust Cap For Tire Valves or The Like. William T. Hunter, Jr., Woodhaven, N. Y., assignor to A Schrader's Son, Inc., Brooklyn, N. Y.

1,488,933. Method & Apparatus for Tire Manufacture. Thomas Midgley, Hampden, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,488,943. Dust Cap. Maximilian Charles Schweinert, New York, N. Y.

1,488,998. Pneumatic Tire. Charles Lancaster Marshall, London, England.

APRIL 8, 1924

1,489,237. Cushion tire. Paul S. Donhar- Cory, Ind.

1,489,364. Cap for valves or the like. Maximilian Charles Schweinert, West Hoboken, N. J.

1,489,432. Pneumatic tire. William W. Gallemore, Mendon, Ill.

1,489,764. Automobile rim. Peter E. Johnson, Cambridge, Ill.

1,489,477. Process for rubber patches. Robert M. Bowes and Charles E. Bowes, Indianapolis, Ind.

1,489,484. Window-guide channel and method for making the same. Elias E. Davidson, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y.

1,489,526. Means and method of manufacturing tourniquets. Albert Ennis Henderson, Toronto, Ont., Canada.

1,489,589. Vehicle tire and rim. Charles E. Bonine, Cheltenham Township, Montgomery County, Pa.

1,489,645. Tool for removing dust caps from pneumatic tire valves. James H. Mendenhall, Nottingham, Pa.

1,489,790. Process of muffling lithopone and apparatus therefor. Herman G. Schanche, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

1,489,819. Insulated wire-making machine. William E. Cook, St. George, N Y., and Merritt B. Bradt, Pennington, N. J., assignors to Peerless Insulated Wire & Cable Co., New York, N. Y.

1,489,867. Method of making blow-out shoes. Louis H. Voss, Detroit, Mich.

1,489,922. Air-bag-buffing machine. James W. Brundage, Akron, Ohio, assignor to the Miller Rubber Co., Akron, Ohio.

1,490,036. Tire-pressure gauge. Creedy C. Sheppard, Washington, D. C.

1,490,073. Accelerator for rubber-vulcanizing, process of manufacturing same, and vulcanizing process. Norman Arthur Shepard and Justus Harvey Doering, Akron, Ohio, assignors to the Firestone Tire & Rubber Co., Akron, Ohio.

Trade Marks

APRIL 1, 1924

Subject to opposition within 30 days of above date

AT-RU-CO—No. 170,793. Ernest Schulthess, doing business as Atlas Rubber Co., New York, N. Y. Rubber hose.

H.C.A. PARIS—No. 182,939. Societe Anonyme "Crayons Conte," Regny and Paris, France. Rubber erasers.

TOP-NOTCH—No. 182,953. The Advance Rubber Co., Brooklyn, N Y. Tires and tubes.

DESIGN consisting of an oval containing the representation of a seal, etc.—No. 189,790. Baxton Roofing & Supply Co., Milwaukee, Wis. Rubber shingles.

DESIGN consisting of a circle containing the letter H, etc.—No. 189,790. Kohinoor Bleistiftfabrik L. & C. Hardmuth in Budweis, Czechoslovakia. India rubber bands.

Not Subject to Opposition

HIKER—No. 182,230. Remy-Landsberg Shoe Co., Philadelphia, Pa. Shoes made of rubber, fabric, leather and combinations of the same.

FIT FOR EVERYBODY—No. 182,242. Jacob Adler & Co., Inc., New York, N. Y. Rubber gloves.

APRIL 8, 1924

Subject to opposition within 30 days of above date

TUFHIKER—No. 190,908. Avon Sole Co., Holbrook, Mass. Rubber soles.

DESIGN incorporating the word "Varco"—No. 190,959. Varsity Co., Norwood, Mass. Boots and shoes made of leather, rubber, etc.

DUCKTITE—No. 191,189. Claude Sleep, Hartsville, Mass. Waterproofing compounds for use in connection with auto tops, rubber, canvas, etc.

DESIGN containing the word "Hood" transversed by an arrow—No. 191,317. Hood Rubber Co., Watertown, Mass. Tires and tubes.

DESIGN containing the abbreviation "Cha-Roes"—No. 191,717. Charles Roeseler, New York, N. Y. Rubber shield to protect the sleeve.

DESIGN consisting of an arrangement of the letters "RMR"—No. 192,088. H. H. Robertson Co., Pittsburgh, Pa. Mineral rubber.

COUNSELOR—No. 192,282. Standard Four Tire Co., Keokuk, Iowa. Tires and tubes.

DESIGN containing the word "Tyer"—No. 192,449. Tyer Rubber Co., Andover, Mass. Rubber balls, balloons, baseball centers, and bladders.

DESIGN containing the word "Tyer"—No. 192,451. Tyer Rubber Co., Andover, Mass. Bath sprays.

REPRESENTATION of a small lighthouse—No. 192,593. Beacon Tire & Rubber Corp., Beacon, N. Y. Tires and tubes.

Not Subject to Opposition

DESIGN incorporating the words "Chemical Tire-grip"—No. 182,517. Insectol Chemical Co., Inc., Greenwood, Mass. Tire patches.

SHIPLEY—No. 182,539. National Consolidated Rubber Co., San Francisco, Cal. Tires, tubes and self-sealing liners for pneumatic tires.

Cottons and Fabrics

(Continued from Page 63)

TIRE FABRICS

No outstanding developments have influenced the tire fabric market during the past fortnight. If the fashion in which orders are placed may be taken for an index, no singleness of purpose is evident in the operations of tire manufacturers. Orders are being placed for small prompt lots for stocks, some business is being done on old contracts and sales in general show no improvement. Fabric producers consider that henceforth orders will take the form of stock commitments until the tire manufacturers place their 1925 contracts. Mills now working are expected to be engaged for the remainder of the month. Quotations are firmer in tone but as yet the plans to curtail tire production have been without material effect on the market.

According to a mill man recently returned from a visit to Akron, feeling in the trade is a good deal more confident than the sellers in the New York fabric market believe. Indications are that within the next three or four weeks important factories will begin covering for July-August. He stated that offers to buy July goods were refused by mills unless August delivery was included. "The fly in the ointment of the fabric mills' continues to be that of prices," he stated. "Cotton fluctuations are hardly noticed by the rubber people—they feel too confident of their ability to use the fabric supply situation to their own advantage."

CORD FABRICS

Combed Sakellarides		Nominal	
Combed Peeler	lb.	Nominal	
Carded Peeler	lb.	.56 @	.58
Combed Egyptian uppers	lb.	Nominal	
Carded Egyptian uppers	lb.	.63 @	.64

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed	lb.	Nominal	
17½-ounce Egyptian uppers, carded	lb.	.61 @	.63
17¼-ounce Sakellarides, combed	lb.	Nominal	
17¼-ounce Peeler, combed	lb.	Nominal	
17¼-ounce Peeler, carded	lb.	.55 @	.57

Ducks—Inquiry in the duck market has been about average. Few of these inquiries developed into orders until the 5th when an improvement was noted. Jobbers bought both spot and contract. Factors consider that both consumer and jobber stocks must be low. The good business which developed was not continued but a fair amount of small orders was placed, especially contracts for spot bale lots. As prices on the 12th afforded losses on orders booked several mills had sufficient courage to advance their prices about 2 cents a pound.

Burlaps—On the 4th and 5th a firmer tendency was manifested in the market when shipment quotations rose 3d to 4d and asking prices were raised 5 points. On the 7th an erratic sterling exchange caused shipper agents and re-sellers to hold their quotations at former high levels but on the next day a decline in sterling brought down the prices to their old levels. Little interest was shown in heavies, spots and futures, sales being confined to near and far afloat lights, until the 14th when inquiries were received for quantities of spot heavies.

SHEETINGS

40-inch	2.50-yard	yd.	.16¾ @	.17
40-inch	2.85-yard	yd.	.14½ @	.14¾
40-inch	3.15-yard	yd.	.14¾ @	—
40-inch	3.60-yard	yd.	.12¾ @	—
40-inch	3.75-yard	yd.	.11¼ @	—
40-inch	4.25-yard	yd.	.10¼ @	—

DUCKS

Belting	lb.	.45 @	.47
Hose	lb.	.45 @	.47
Enameling	lb.	.48 @	.50
Shoe Ducks	lb.	.50 @	.54
Single filling	lb.	.22½ @	.24
Double filling	lb.	.25 @	.26

BURLAPS
(Carload Lots)

7½-ounce	40-inch	6.00 @	6.05
8 -ounce	40-inch	6.00 @	6.10
10 -ounce	40-inch	7.90 @	—
10½-ounce	40-inch	7.85 @	—

DRILLS

37-inch	2.75-yard	yd.	.14¼ @	.14¾
37-inch	3.00-yard	yd.	.14 @	—
37-inch	3.25-yard	yd.	.13 @	.13¼
37-inch	3.50-yard	yd.	.12½ @	—
37-inch	3.95-yard	yd.	.10⅞ @	.11

OSNABURGS

30-inch	7-ounce	.15 @	.15½
40-inch	7-ounce	.17 @	.17½